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Torsional Splittings and Assignments of the Doppler-Limited Spectrum of Ethane in the C-H Stretching Region*

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The Doppler-limited absorption spectrum of the C-H stretching region of ethane has been recorded at $T \simeq 119$ K with a tunable difference-frequency laser spectrometer. The strong torsional hot band structure at room temperature is eliminated at 119 K, and the enhanced resolution from the Doppler width reduction allows us to observe small torsional splittings. The two fundamentals in the region, ν_7, a perpendicular band and, ν_5, a parallel band have been essentially completely assigned as have a large number of transitions in the parallel component of the $\nu_8 + \nu_{11}$ combination band. A number of perturbations of both global and local nature have been observed. The complete spectrum and a listing of transition wavenumbers, intensities and assignments are presented here to facilitate identification and quantitative analysis of ethane in a variety of monitoring applications. Precise ground state rotational constants have been determined from combination differences.

Key words: C-H stretching region; difference- frequency laser; Doppler-limited resolution; ethane; ground state constants; infrared spectrum; low temperature spectrum; torsional splittings.

1. Introduction

Although ethane is the simplest hydrocarbon containing a saturated carbon-carbon bond and has very high symmetry (D_{3d}), the extremely dense and complex rotational fine structure of its infrared bands has defied complete resolution until recent advances in Doppler-limited tunable laser and Fourier transform instrumentation. Previously, high-quality grating spectra of the C-H stretching region at 0.025 cm^{-1}resolution permitted Cole, Lafferty and Thibault [1][1] to partially assign the rotational transitions of the ν_7 perpendicular band. More recently Cole, Cross, Cugley and Heise [2] deconvolved similar grating data to ~0.015 cm^{-1} to observe somewhat more structure in this same band. We present here the Doppler-limited absorption spectrum of the infrared active C-H stretches of ethane recorded at $T \simeq$ 119 K (Doppler FWHM = 0.0043 cm^{-1}) with a tunable difference-frequency laser spectrometer. Both fundamentals, ν_7 centered at 2985.39 cm^{-1} and the parallel band ν_5 at 2895.67 cm^{-1}, have been fully resolved and assigned, and much of the $\nu_8 + \nu_{11}$ combination band has been identified.

The principal complications in the infrared spectrum of C_2H_6 arise from the relative torsional motion of the two methyl groups about the saturated C-C bond [3]. The moderate potential barrier (of ~1024 cm^{-1}) to free internal rotation leads to a low frequency torsional mode ν_4 at ~290 cm^{-1} as determined by a number of calorimetric [4,5] and spectroscopic [6,7] techniques. This mode is highly excited at room temperature giving rise to "hot bands" associated with each normal band originating in the ground vibrational state. These hot bands are effectively suppressed in the present study by maintaining the ethane sample at the lowest possible temperature above the vapor condensation point. Overtones and combination states of this low frequency torsional mode are also in Fermi or Coriolis resonance with virtually all the higher vibrations of the molecule, causing severe perturbations whose complexity increases dramatically with the wavenumber of the other bands because of the increasing number of possible combinations.

Tunneling through the torsional potential barrier creates a further doubling of the energy levels of the molecules which may be manifest as small splittings in the rovibrational transitions as discussed by Susskind [8]. However, for nontorsional modes, such as those studied here, the barrier and, hence, the torsional split-

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[1]Figures in brackets indicate literature references at the end of this paper.

tings are not expected to vary significantly from the ground state. Thus the splittings for nontorsional infrared transitions, which arise from the *difference* in the splittings of the upper and lower vibrational levels [8], are expected to be unresolvable, even at the Doppler limit. Nevertheless the resonant interactions with torsional overtones and combinations, mentioned above, induce variations in the barrier giving rise to observable torsional splittings in the present work. Some of these are illustrated in figure 1 for the region around $^{R}Q_5$ of the ν_7 band, as brought out by the resolution enhancement and spectrum simplification resulting from lowering the ethane temperature. The torsional doublets of the $^{R}R_2(7)$ and $^{R}R_3(4)$ lines and the interleaved $^{R}Q_5$ subbranch are unambiguously characterized by their nuclear spin statistical weight intensity ratios calculated by Wilson [9].

The first observation of torsional splitting in ethane was made in diode laser spectra of the ν_9 band by Patterson, Flicker, McDowell and Nereson [10]. These splittings also arise from perturbations, induced by a resonance with $3\nu_4$; but since that is the only possible

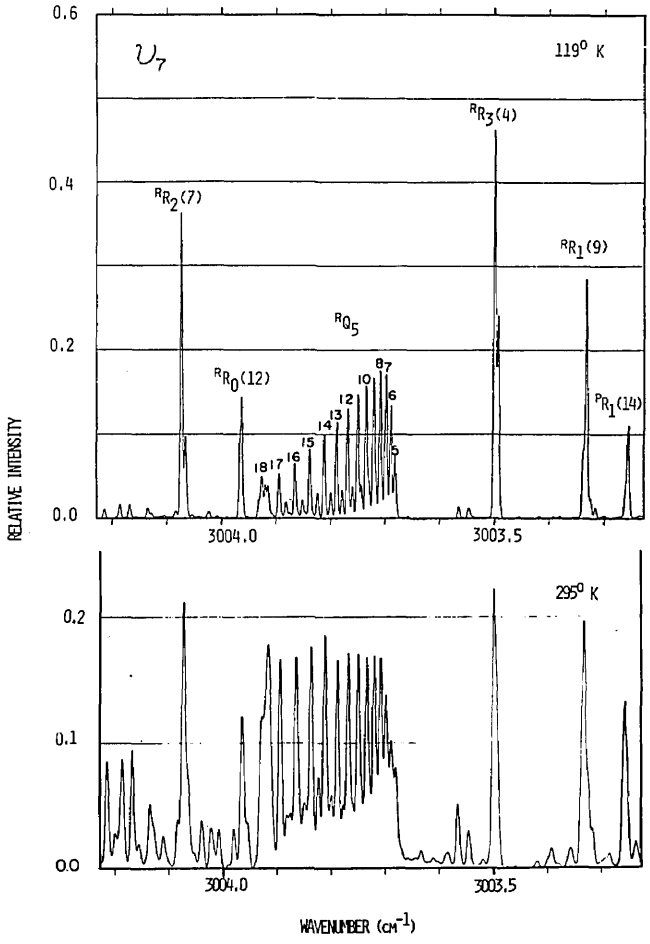


FIGURE 1. Comparison of the ethane spectrum in the region of the $^{R}Q_5$ subbranch of the ν_7 band for temperatures of 119 K and 295 K.

resonance with ν_9, that band is more amenable to analysis than the complex C-H stretching bands. Two detailed studies of the ν_9 band are now in progress [11,12]; both are based on Doppler-limited diode laser spectra of the Q branches and comprehensive, precision Fourier transform interferometer data. In the present study of the C-H stretches, the torsional splittings exhibit many interesting patterns indicative of a variety of interactions and perturbing states.

The complex low temperature Doppler-limited spectrum of ethane between 3051 and 2862 cm^{-1} is given in this report along with a listing of transition wavenumbers, intensities and assignments. We also discuss the assignment procedure and the more interesting spectral features associated with the perturbations, torsional splittings and combination bands. A precise set of ground state rotational constants obtained from combination differences is given since microwave data do not exist for this nonpolar molecule. These definitive spectra are truly characteristic of the molecule without instrumental distortion since the laser linewidth (~0.0003 cm^{-1}) is much narrower than the Doppler width. Hence, the spectral patterns should be useful for the identification and quantitative analysis of ethane for a number of practical applications. For example, ethane is a principal constituent of natural gas (0 to 20% with ~7% average) and can be used for labelling sources, detecting leaks and monitoring pipeline transmission and LNG carriers [13]; it is one of the major hydrocarbon emissions in automobile exhausts and can interfere with the measurement of more toxic components [14]; and it has been observed in the atmosphere of several outer planets [15] with significance to extraterrestrial organic chemistry.

2. Experimental Considerations

The high resolution ethane spectra reported here were recorded with a tunable difference-frequency laser spectrometer developed at MIT Lincoln Laboratory for obtaining precise and comprehensive Doppler-limited vapor-phase spectra in the 2.2 to 4.2 μm region. The instrument is based on the nonlinear optical down-conversion of CW visible single-mode argon ion and tunable dye lasers in a $LiNbO_3$ mixing crystal. The basic operating characteristics of the system [16] along with techniques of drift compensation [17], stabilization and automated data processing [18] and linear scan control [19] have been detailed elsewhere, so we will discuss here only those features pertinent to the present investigation.

Since the C-H stretching bands of ethane are quite extensive (covering ~ 200 cm^{-1}), the difference-frequency system was operated in a broad survey, rapid scan mode. The absorption spectra were recorded in continuously

scanned 3.75 cm^{-1} segments overlapped at intervals of 3 cm^{-1}. The scan rate was 0.0125 cm^{-1}/s or 375 MHz/s so each segment was scanned in 5 minutes. The post-detection time constant was 40 ms (corresponding to 5 x 10^{-4} or 15 MHz) which was short enough to allow full response to the sharp Doppler-broadened lines (FWHM = 128 MHz for C_2H_6 at $T \simeq 119$ K) but long enough for good signal-to-noise ratio of ~500. The transmission traces were digitized at a 20 Hz rate (6000 points per segment, 6.25 x 10^{-4} cm^{-1} per point) for data storage and subsequent numerical processing. The instrumental width, due primarily to the dye laser free-running jitter, was about 10 MHz FWHM. Thus the effect of instrumental broadening is negligible since convolution of the Gaussian profiles of the Doppler and laser distributions results in the widths adding in quadrature.

The ethane spectra were recorded over a period of 2 days. Each day's run was calibrated against CH_4 reference lines from the Fourier transform interferometer data of Tarrago *et al.* [20]. The first day's run was interpolated between the R(3) and P(7) manifolds of the ν_3 band of CH_4 while that of the second day between P(7) and P(15) using a 5 cm confocal Fabry-Perot interferometer with a free spectral range of 0.050027(1) cm^{-1}. The interorder spacing of this scan calibration interferometer can be measured to a precision of ±2 x 10^{-7} cm^{-1} over a 100 cm^{-1} interval, but it exhibits a small frequency dispersion and overnight thermal shifts which must be checked during extended runs. The determination of the spectal line wavenumbers for these rapid survey scans was made to a relative precision of ~ ±4 x 10^{-4} cm^{-1} which was slightly better than the least reading for the digitizing grid. The absolute accuracy of the wavenumbers may be slightly worse due to uncertainties in the reference line standards.

In order to obtain linestrength information from the transmission traces, one must account for Beer's law, $\alpha(\omega) = (\varrho L)^{-1} \ln(B(\omega)/S(\omega))$. Here $\alpha(\omega)$ is the absorption coefficient in units of $(\varrho L)^{-1}$ where ϱ is the sample density and L is the cell length; $S(\omega)$ is the transmission and $B(\omega)$ is the empty cell baseline. In this case the baseline was entered manually on a coarse grid (0.125 cm^{-1}) since it was not practical to evacuate the cold cell and refill for each trace. Also our automatic baseline interpolation routine, which keys on the background between lines, did not work reliably for ethane since the spectrum was so dense. The manual baseline estimation is only adequate to ~ ± 1 percent because of strong channeling of the spectra from the cold cell windows. The baseline uncertainties dominate the relative line strength errors since the actual transmission spectra are reproducible to ≃ ±0.2 percent. In addition, absolute intensities depend on measurement accuracy of the cell length (29.4 ± 0.1 cm), the fill pressure (225 ± 4 m Torr at $T = 295 \pm 1$ K), the sample temperature (held at $T = 119 \pm 3$ K) and, to a lesser extent, on sample purity. Here we used natural isotopic ethane of research grade from Matheson with a quoted purity of 99.96 percent; it exhibited no trace of methane or other simple hydrocarbons in the spectrum. In the atlas, corrections are made for the isotopic abundance of $^{12}C_2H_6$.

The sample cold cell was a copper tube with thinned end sections for stress-free epoxy mounting of ZnSe windows required because of differential thermal contraction. Copper cooling coils were soldered to the tube and an evacuable stainless steel jacket with CaF_2 windows provided thermal isolation. The cell was cooled by manually controlling the flow of He gas through a liquid N_2 heat exchanger and then through the cell coils. The temperature was measured with a single platinum resistance thermometer imbedded in the copper cell wall. The uniformity of the temperature is expected to be better than the manually controlled temperature setting which dominates the absolute intensity errors (~ ±3% for low J and K).

3. Spectral Features

The fundamentals, ν_5 and ν_7, are examples of parallel and perpendicular bands whose assignment, as is customary, is based on selection rules, "missing lines" and consistent ground state combination differences. Where observed, the torsional doublets provide a definitive confirmation of the K and some J assignments because of their distinctive intensity ratios for particular rotational quantum numbers. The nuclear spin statistical weights for these doublets derived by Wilson [9] yield the intensity ratios of 4:1 for K not a multiple of 3; 2:1 for K a multiple of 3 but not 0; and for $K = 0$ a ratio of 3:1 for J even and 5:3 for J odd. These ratios are illustrated in figure 1 for $K = 2$, 3 and 5 levels of ν_7 and in figure 2 for the $K = 0$, 2 and 4 cases in the P(6) and P(7) manifolds of ν_5. Each torsional component is labelled in the atlas according to the ground state symmetry species of the permutation-inversion group $G_{36}^{\dagger}$ for ethane-like molecules exhibiting internal rotation as discussed by Hougen [21].

Though the assignments for the fundamentals are firm and rather complete, a number of severe perturbations are observed due to accidental resonant crossings of energy levels. However, for both ν_5 and ν_7 the initial K subband lines at $J = K$ appear regular and undisturbed. This implies that both bands are affected by X-Y Coriolis interactions since the matrix elements governing such a resonance are proportional to $[J(J+1) - K(K+1)]^{1/2}$. In most cases the effect of such a perturbation is to change the effective B values of individual subbands but to leave the K structure unaffected. However, for the

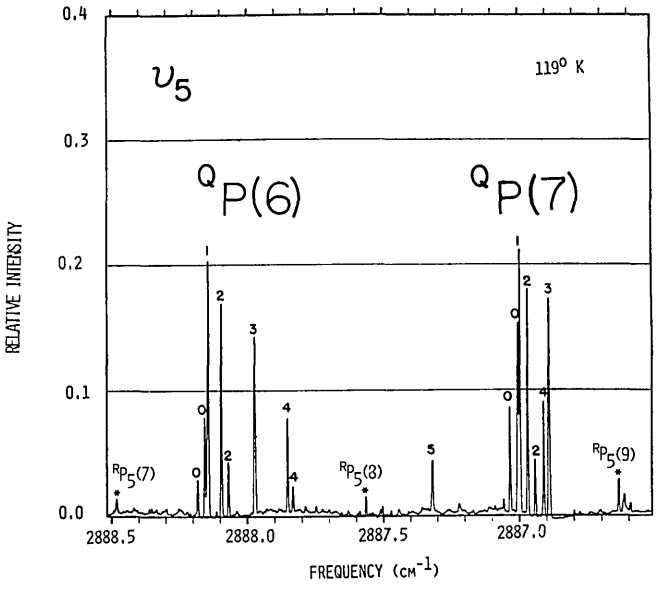


FIGURE 2. Spectrum of C_2H_6 near the P(6) and P(7) manifolds of the ν_5 band at $T = 119$ K. Perturbation-induced lines are labelled with an *.

very close resonances observed in some of the subbands here, the perturbations are severe enough that they cannot be fit using a standard power series expansion. In ν_7 such a resonance is dramatically exhibited by the $^RQ_5$ subbranch shown in figure 1. This subbranch is much more spread out than lower ^RQ_K subbranches and is degraded in opposite direction to the higher ^RQ_K subbranches; it also shows an abrupt head and gap above $J = 18$. In addition, there are numerous smaller local perturbations, one of which, shown in figure 3, occurs in the

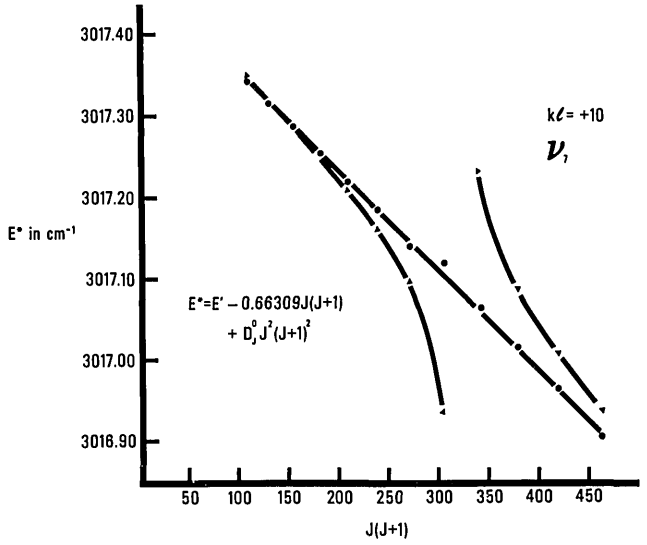


FIGURE3. Torsional splittings in the $K' = 10$, $\Delta K = +1$ subband of ν_7. The dots represent the stronger $A_{1s} - A_{2s}$ symmetry components and the triangles represent the weaker $E_{3s} - E_{4s}$ symmetry components.

$K = 10$, $\Delta K = +1$ subband, manifest in a rapid increase in the torsional splitting as a function of J to a value ~ 0.1 cm^{-1} at $J' = 17$, above which it suddenly reverses sign and decreases again to higher J'. In some subbands of ν_7 the torsional splitting is constant or a monotonic function of $J(J + 1)$ and in others it appears to be irregular.

On the other hand, perturbations in ν_5 appear to be dominated by a strong resonance near the $K = 5$ energy level stack. The effect of this resonance is to degrade the $K = 5$ subband to lower frequency while the others are degraded to higher frequency as shown in figure 4. Despite the degradation, the subband "origins" at $J = K$ fall on a relatively unperturbed straight line, as seen in figure 4, implicating the X-Y Coriolis interaction. From

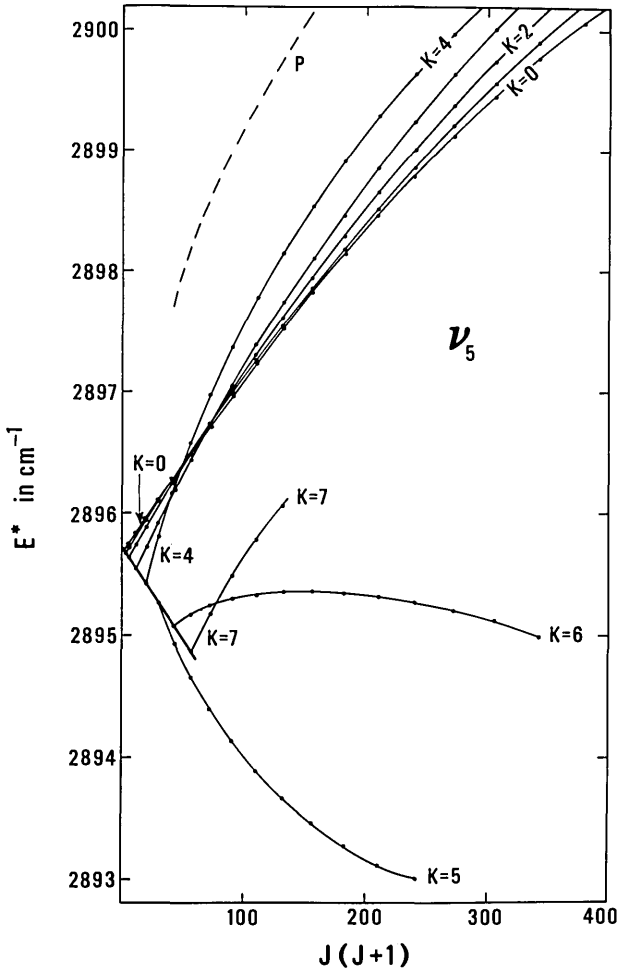


FIGURE 4. Reduced energy for the stronger torsional components of the K subbands of ν_5. The dashed line represents the K = 6 subband of an E_u vibration perturbing $K = 5$ of ν_5 and observed by resonant mixing. Here $E^* = \nu_5(J'K', J''K'') + B_0J''(j'' + 1) - B_5^*J'(J' + 1)$ where $\nu_5(J'K', J''K'')$ are the transition wavenumbers for the band and $B_5^* = 0.6624$ cm^{-1} is chosen to adjust the scale of the plot.

the a_{2u} symmetry of ν_5 and the E_g species for the vibrational operator of the X-Y Coriolis coupling, we can conclude that the perturbing vibration has E_u symmetry. The resonance mixing is strong enough near the crossover that the perturbing levels accompanying the $K = 4$ and 5 subbands borrow sufficient intensity to be observed in the spectrum. The levels perturbing $K = 5$ are positioned along the dashed curve, labelled P in figure 4, and a few of the corresponding perturbation-induced transitions are shown in figure 2, labelled with an asterisk. We believe that these perturbing levels belong to the $K = 6$ subband of the resonant state because of the $\Delta K = \pm 1$ requirement for the X-Y Coriolis interaction and the fact that the $J = K = 5$ level of ν_5 is unperturbed. The K assignments for the perturbating subbands must be regarded as tentative since we have so few series, but they are consistent with the intensity ratios of their torsional doublets which have splittings comparable to those in ν_5.

The perturbation-induced torsional splittings take the interesting form shown in figure 5. For the odd K subbands the $J = K$ transitions are not observably split, but at higher J the splitting increases regularly, to as much as ~0.1 cm^{-1} in some cases. Even for the most perturbed subband, $K = 5$, the doublet of the $J = 5$ transition is not resolved while $J = 6$ is. In the even K subbands however, the $J = K$ transitions are all split by ~0.02 cm^{-1} and, except for $K = 6$, the splittings increase slowly with J. For $K = 6$ the splittings decrease with J, become unresolved at about $J = 14$ and are resolved again at higher J with the splittings reversed. We currently have no consistent model for this striking behavior of the torsional splittings in ν_5. It is clear however, that recognizing the presence of torsional doubling was the key to assigning ν_5 which was missing in prior studies [1,2].

The combination bands present a somewhat more difficult situation to analyze. First there are ambiguities in

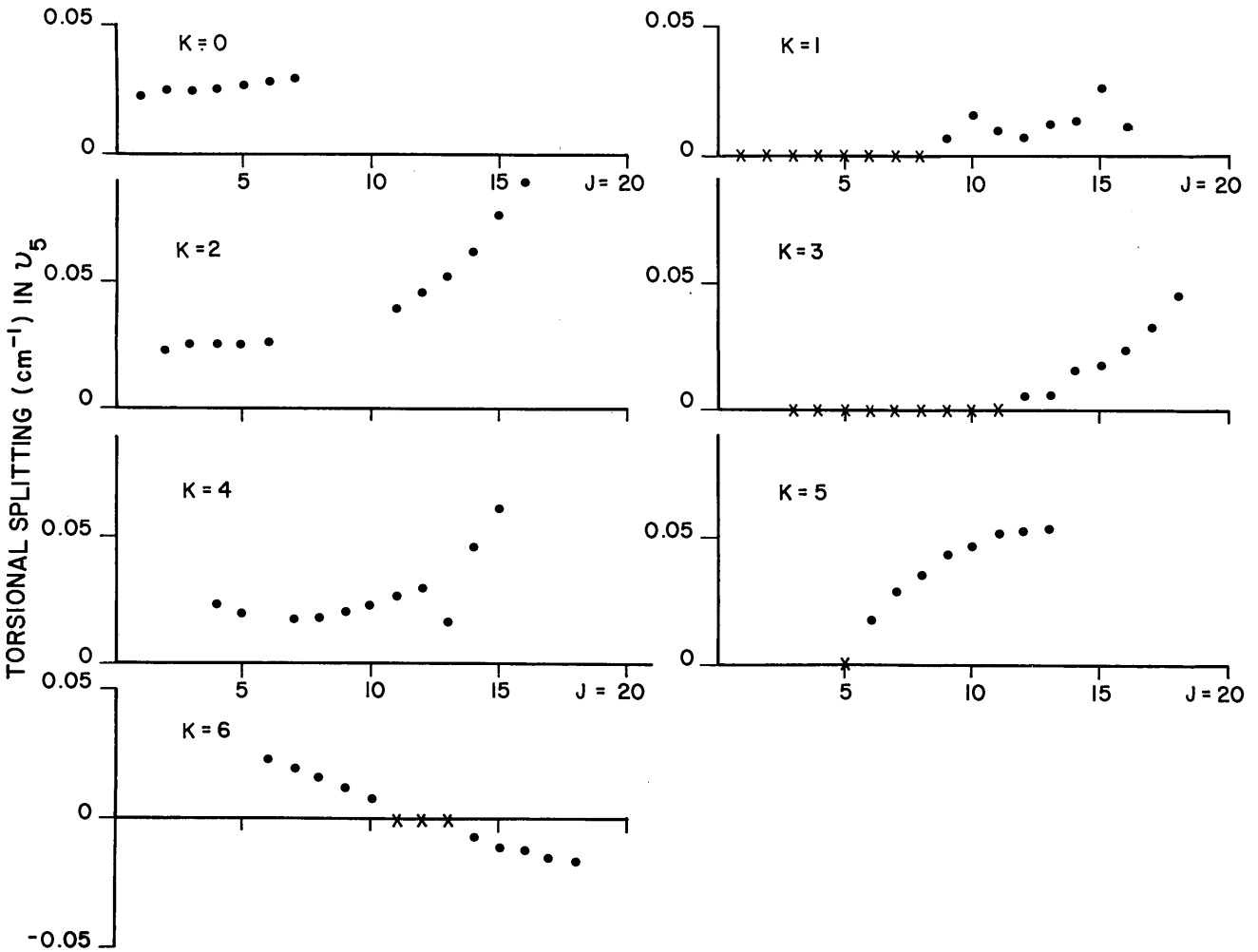


FIGURE 5. Torsional splittings in the ν_5 band of C_2H_6 for $0 \leq K \leq 6$. Here X represents unresolved doublets.

the vibrational sublevel symmetries for the $\nu_8 + \nu_{11}$ combination band since there are several components possible ($e_u \times e_g = A_{1u} + A_{2u} + E_u$). The E_u component of $\nu_8 + \nu_{11}$ should result in a perpendicular band with an effective $\xi_+ = -(\xi_8 + \xi_{11}) \simeq +0.71$ from the data of Nakagawa and Shimanouchi [22], leading to ${}^{P,R}Q_K$ subbranches spaced by ~7.8 cm^{-1}. We see no direct evidence for such a band in our spectrum. On the other hand, we see at least two moderately strong parallel bands belonging to the A_u components. To first order only the A_{2u} mode should be infrared active, but the normally inactive A_{1u} mode may borrow intensity from A_{2u} via a Z-type Coriolis interaction proportional to $H_{12} = -AK\xi_-$, where $\xi_- = | \xi_8 - \xi_{11} |$, as discussed by Hougen [23]. The appearance of the $A_1 - A_2$ band also depends on the separation, ΔE, between these two states. In the uncoupled limit where either ΔE is large or H_{12} is small, the mixing is negligible and only transitions to the ordinary A_{2u} parallel band would be observed. If $\Delta E = 0$ the mixing will be complete and the resulting infrared band will have the appearance of a perpendicular band (with parallel band intensity patterns [24]) with a Coriolis constant ξ_-. Intermediate cases require a more detailed calculation. The two modes can be distinguished by the presence of a $K = 0$ subband allowed for A_{2u} and forbidden for A_{1u} since the Coriolis coupling is proportional to K.

A number of parallel-type subbands were assigned in this region by first identifying strong series in the R branch with estimated J and K and calculating the Q and P lines using the precise ground state combination differences obtained from the fundamental bands. If the series matches observed lines to within ~0.0005 cm^{-1} and the intensities are consistent, then one can be quite confident of the J assignment. The K assignment is less certain because the combination differences are not strongly K dependent. However again, where torsional splittings are observed ($K = 0$ and 3 in this instance) the K assignments are verified by the doublet intensity ratios. The other subbands were assigned K values according to the missing lines resulting from $J \geqslant K$. In the P and R branches, the lower J transitions are weak and often obscured and overlapped by stronger series. For the Q branch of a parallel band, the lowest J line is strongest, so the Q branches were most useful in establishing the K numbering of the series. One subband has a very small value of $B' - B''$ and its Q subbranch, falling at 2958.0863 cm^{-1}, is not resolved. This subband is tentatively believed to involve $K = 2$ transitions with an uncertainty of ± 1 in K. The prominent feature in the spectrum at about 2953.8 cm^{-1} consists of Q subbranches ranging from $K = 2$ to 6. The lower K subbands have origins both above and below this feature; namely $K = 0$ at 2955.6699(2) cm^{-1}, $K = 1$ at 2956.1196(4) cm^{-1} and 2951.9962(2) cm^{-1} and $K = 2$ at 2958.0866(8) cm^{-1}.

Although the majority of lines occuring in the combination band region have been assigned, their subbands are badly perturbed and many strong series remain unidentified. The ν_8 and ν_{11} band is expected to have both Fermi and Coriolis interactions with the fundamentals and with other higher order overtones and combinations. Also Hougen [25] has pointed out the possibility of an interaction between the A_{1u} component and the totally symmetric a_{1g} C-H stretching mode, ν_1, in ethane-like molecules with an intermediate barrier. This interaction, strictly forbidden for rigid D_{3d} molecules, is permitted during the torsional tunneling motion. It is of course expected to be weak in ethane but the near degeneracy with the Raman-active ν_1 mode at 2953.7 cm^{-1} as determined by Lepard, Shaw and Welsh [26] may account for some of the observed anomalies in this band.

4. Ground State Constants

Since ethane is nonpolar, no microwave data are available for the ground state rotational constants. Thus we have calculated the rotational constants from the large number of ground state combination differences (CDs) collected during the course of the assignment of the C-H stretching bands. We have restricted the CDs used in obtaining the constants to those obtained from the two fundamentals, ν_5 and ν_7, since the lines from these bands are stronger, more precisely measured than those in the combination band, and the assignment is firm in these bands. In calculating CDs from transitions which were split into torsional components, the lines were assigned the ground state symmetry of Hougen [21] according to the observed intensity ratios, and differences were taken between components of the same symmetry. A number of lines were unsplit and, if these lines were sharp, CDs between them were also included in the fit. Lines for which the torsional splitting was only poorly resolved were not included in the fit.

The ground state constants of a prolate symmetric top molecule are defined by the usual term value equation:

$$F(J,K) = (A_0 - B_0)K^2 + B_0 J(J+1) - D_0^J J^2(J+1)^2 - D_0^{JK}K^2(J+1) - D_0^K K^4.$$

No "forbidden" transitions with $| \Delta K | > 1$ were observed in the spectrum so only the coefficients of the J-dependent terms can be determined. A total of 766 CDs were obtained from the fundamental bands of which two thirds were from torsionally split lines. Originally CDs of each symmetry species were fit separately to determine if there were any dependence of the rotational constants on

symmetry or the corresponding nuclear spin. No statistically significant differences were found so all CDs were then fit simultaneously, resulting in the ground state constants given in table 1.

TABLE 1: *Ground State Constants of* $^{12}C_2H_6$ *in* cm^{-1}

A_o	= 2.671[a]
B_o	= 0.6630271(14)[b]
D_o^K	= 1.09 x 10^{-5} [c]
D_o^{JK}	= 2.660(29) x 10^{-6} [b]
D_o^J	= 1.0312(26) x 10^{-6} [b]

[a]Raman value for Ref. [26].

[b]Present work with uncertainties in parentheses representing one standard deviation.

[c]Calculated value from Ref. [22].

Not only does the combination difference fitting provide an excellent set of rotational constants, but it also reflects the measurement precision obtained in this experiment. The standard deviation of the fit is 0.00055 cm^{-1} or 16.5 MHz. Since the ground state fitting is performed on differences, the measurement uncertainty of an individual line is reduced by a factor of $1/\sqrt{2}$ to ~12 MHz. These ground state constants, given with near microwave precision, are certainly an improvement over prior lower resolution grating spectra determinations, and they are compatible with ultra precise Fourier transform interferometer data on ν_9 currently being analyzed [11].

5. Spectrum and Listing

We present in figure 6[2] the complete Doppler-limited absorption spectrum of ethane from 3051 cm^{-1} to 2870 cm^{-1} recorded at $T \simeq 119$ K. Prominent Q branches are labelled for ν_7, and the $K = 0$ subband lines for the P(J) and R(J) manifolds are labelled for ν_5. A listing of the measured transitions is given in table 2 consisting of the line center wavenumber, the peak intensity, the upper and lower state rotational quantum numbers when assigned, the ground state vibration-rotational-torsion symmetry in the $G_{36}^{\dagger}$ group [21] when resolved (the subscript s is suppressed), the vibrational band code and the lower state energy. The vibrational band code is A for ν_7, B for $\nu_8 + \nu_{11}$, C for ν_5, and D for perturbation-induced lines. The lower state energy in wavenumbers is calculated from eq (1) using the precise rotational constants of table 1 and the more approximate values for A_o and D_o^K obtained from Raman spectra [26]. These ground state functions [3], are needed to compute the temperature dependence of the line intensities.

The intensity scale for figure 6 is given in (Torr − m)$^{-1}$ taken from the "raw" experimental fill pressure at room temperature and the cell length. However, the experiment was conducted at constant density since the cell was sealed when the temperature was lowered. Thus for the listing of table 2 we convert the peak intensity units to (Amagat-cm)$^{-1}$ by multiplying (Torr − m)$^{-1}$ by the factor (760/100) x (295/273)/a = 8.397 where a = 0.978 is the isotopic abundance of $^{12}C_2H_6$.

The authors are grateful to A. Mooradian and P. M. Moulton of MIT Lincoln Laboratory for the loan of the cold cell. They are also indebted to J. T. Hougen for numerous helpful discussions on the torsional symmetry and interactions in ethane.

[2]Figure 6 and table 2 are displayed on pages 244-256. References are on page 256.

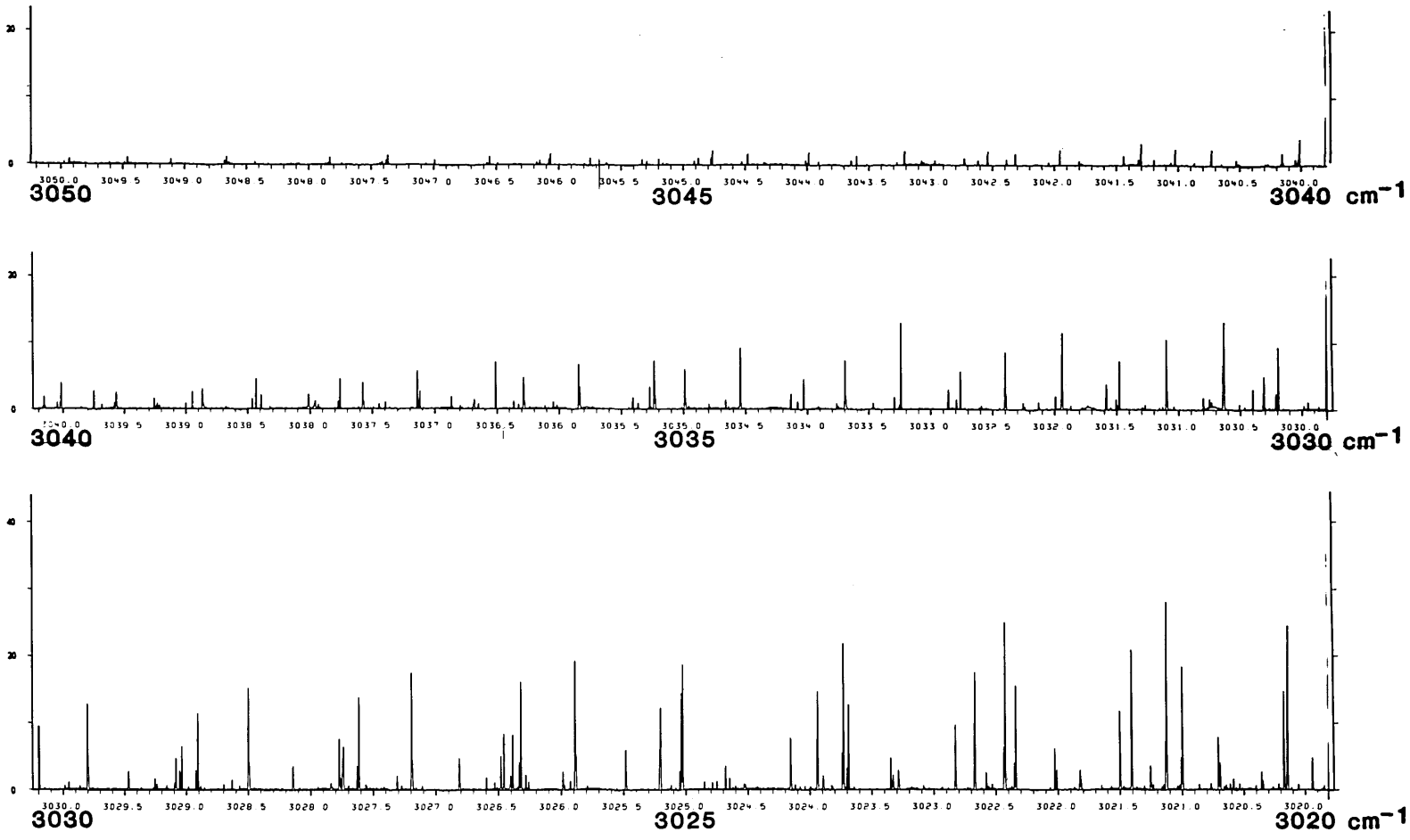
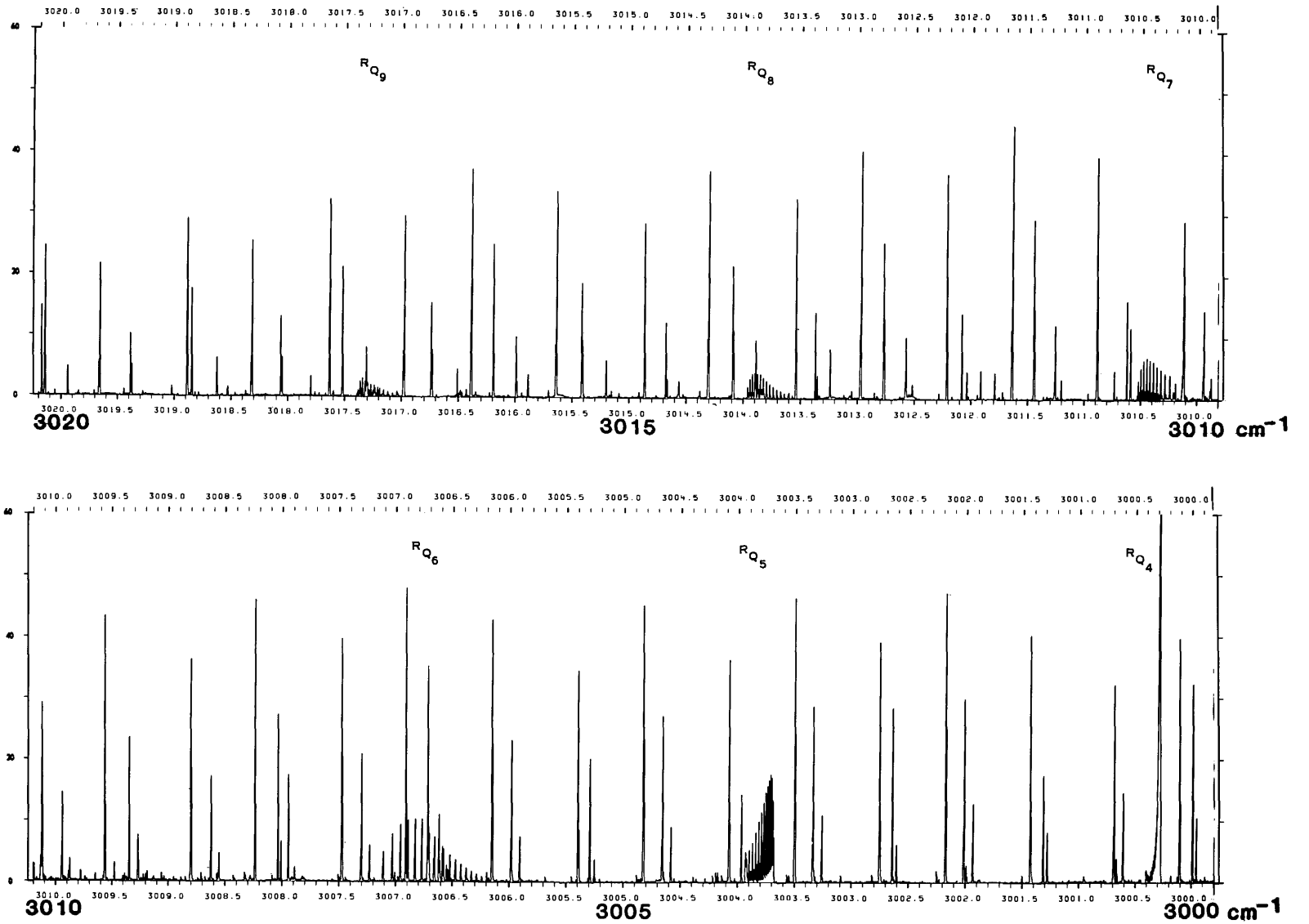


FIGURE 6. Doppler-limited spectrum of ethane at $T = 119$ K. The intensity scale is in $(\text{Torr-m})^{-1}$ uncorrected for temperature or isotopes (see text).



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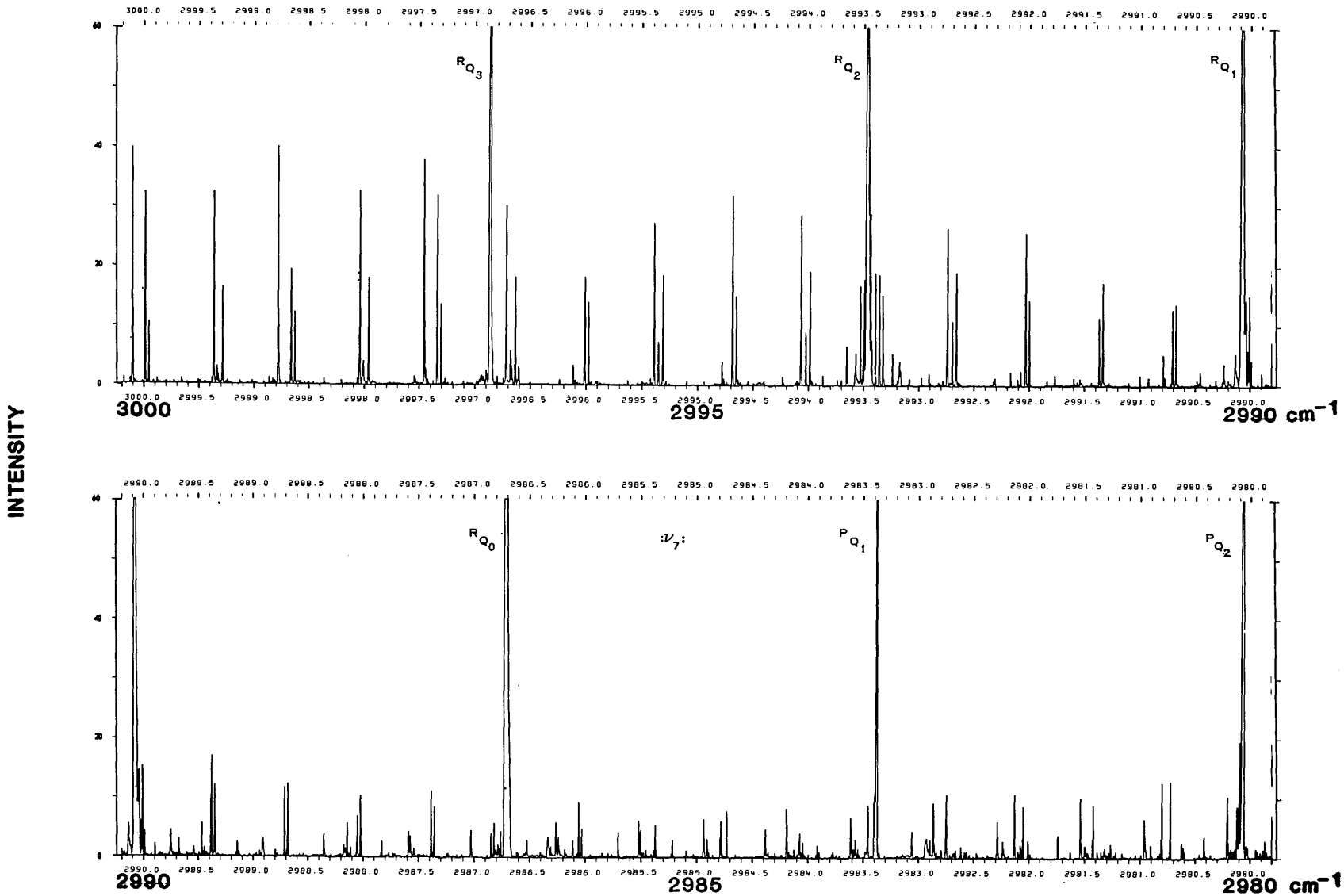

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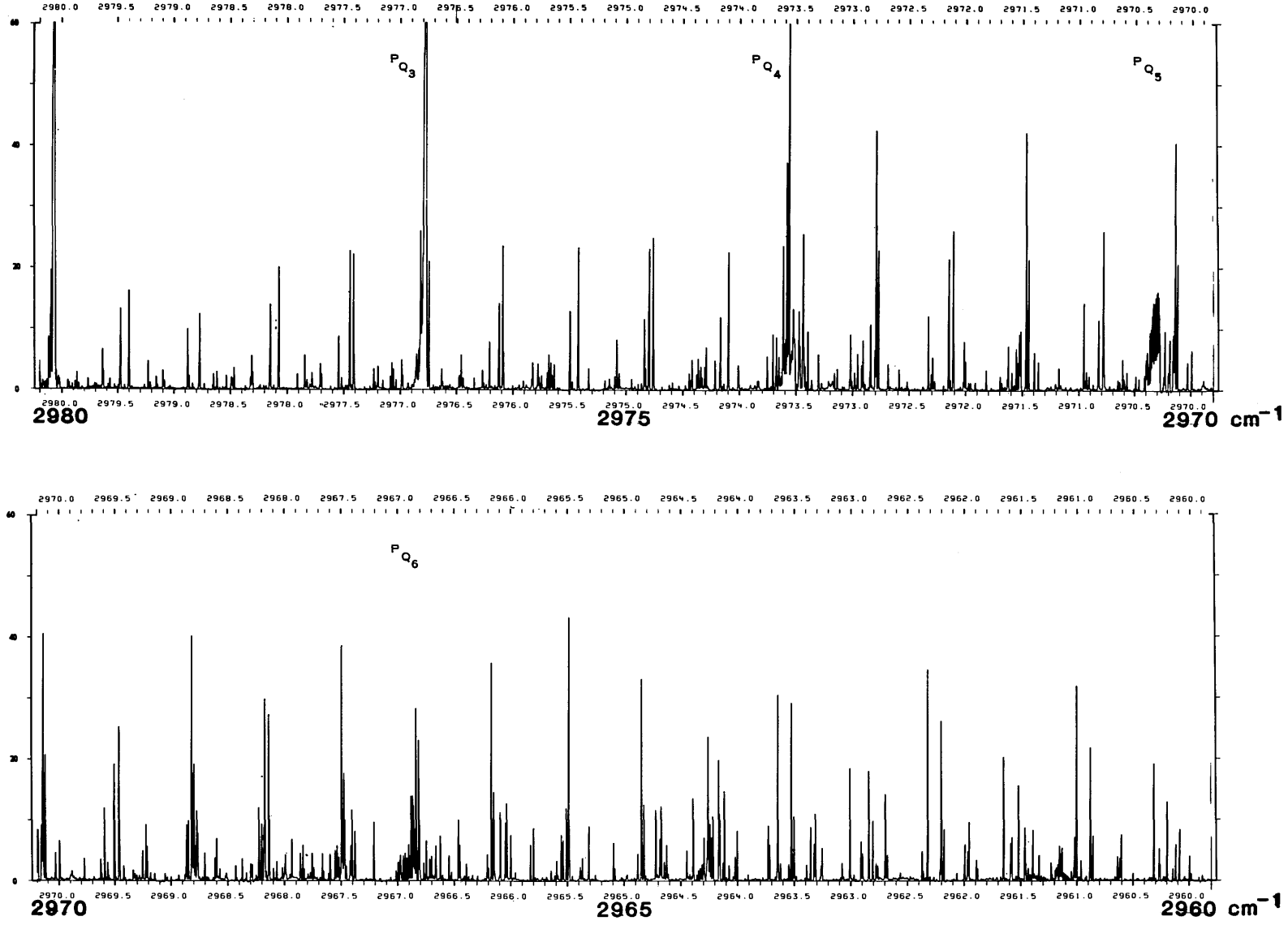

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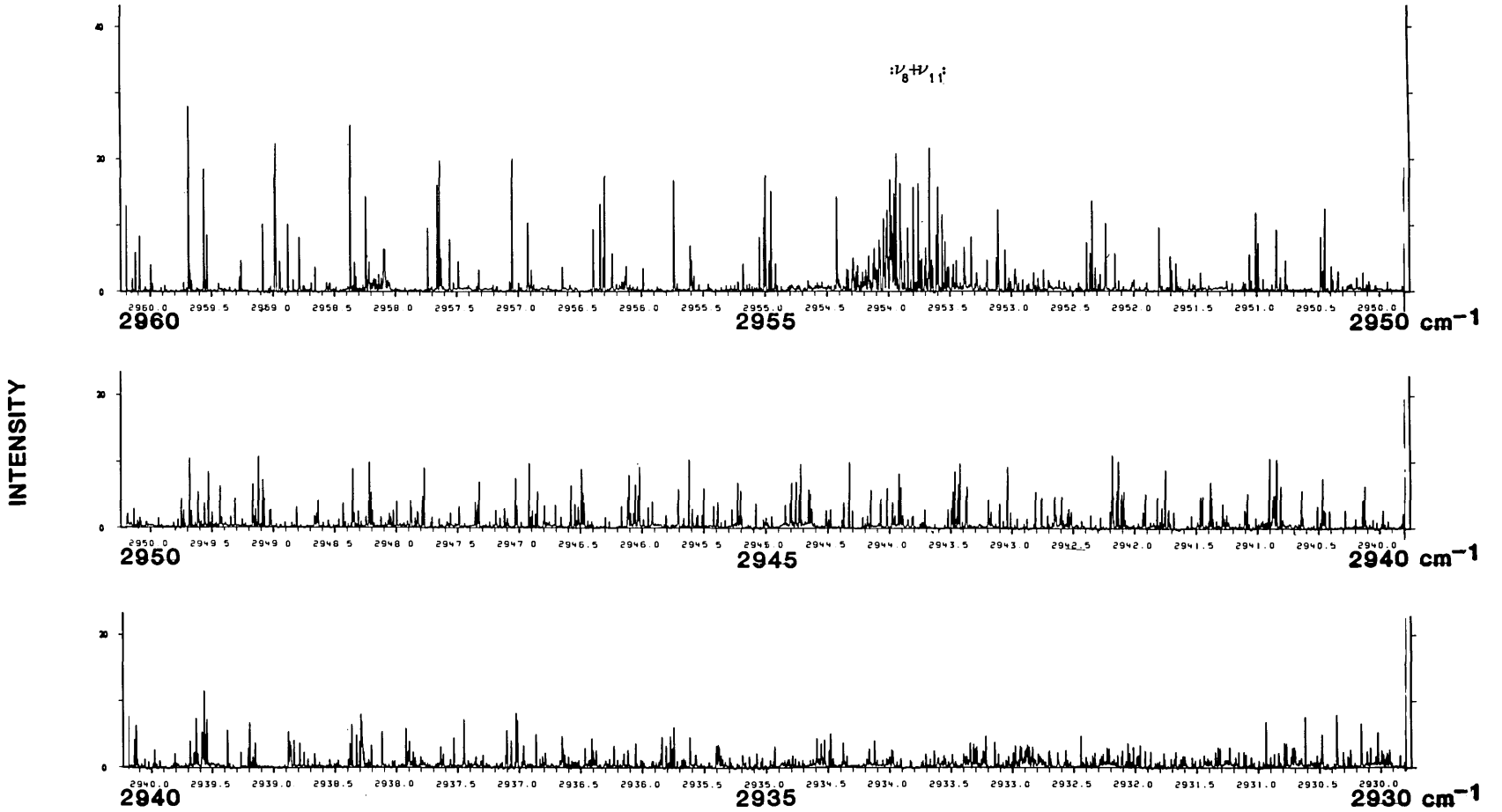

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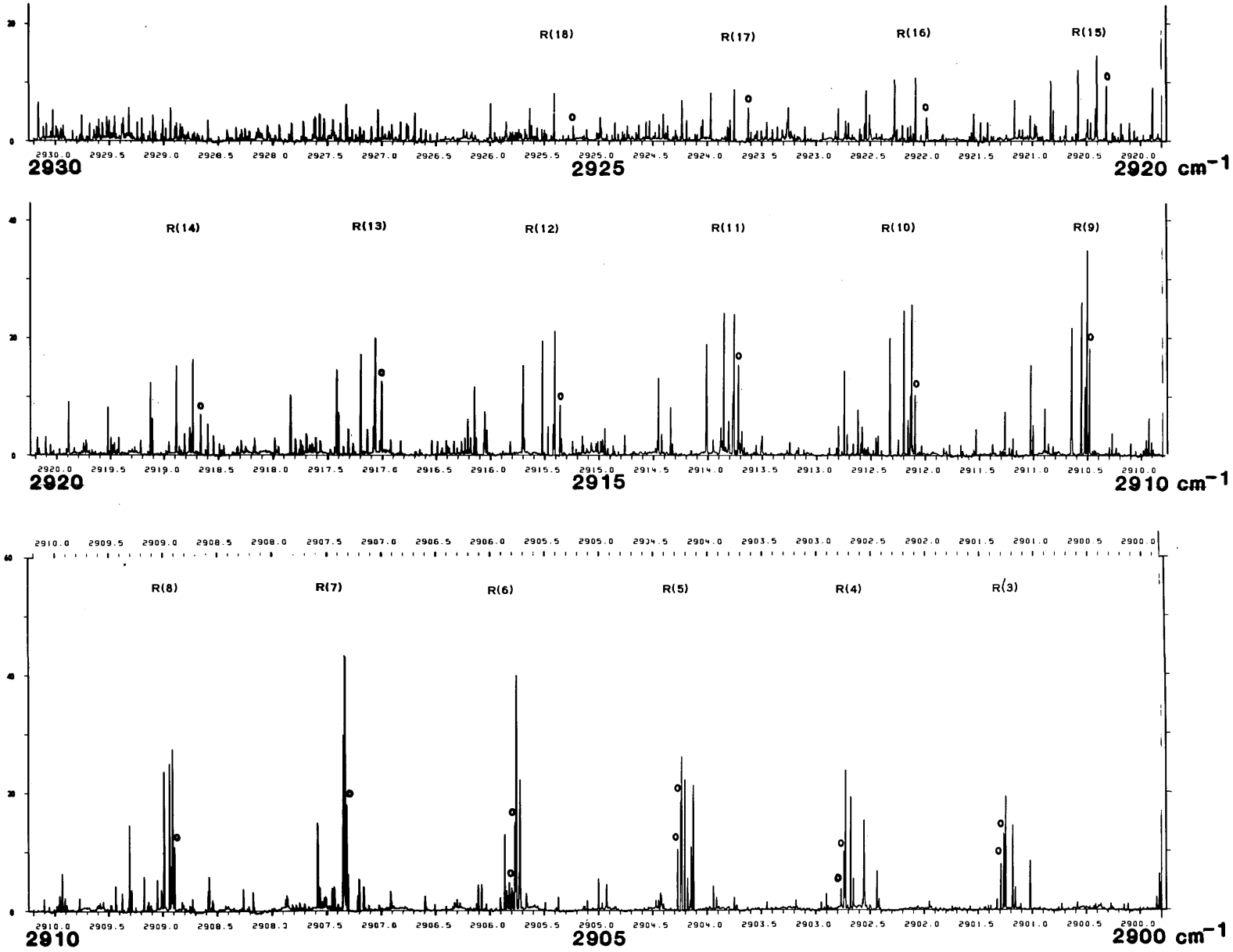

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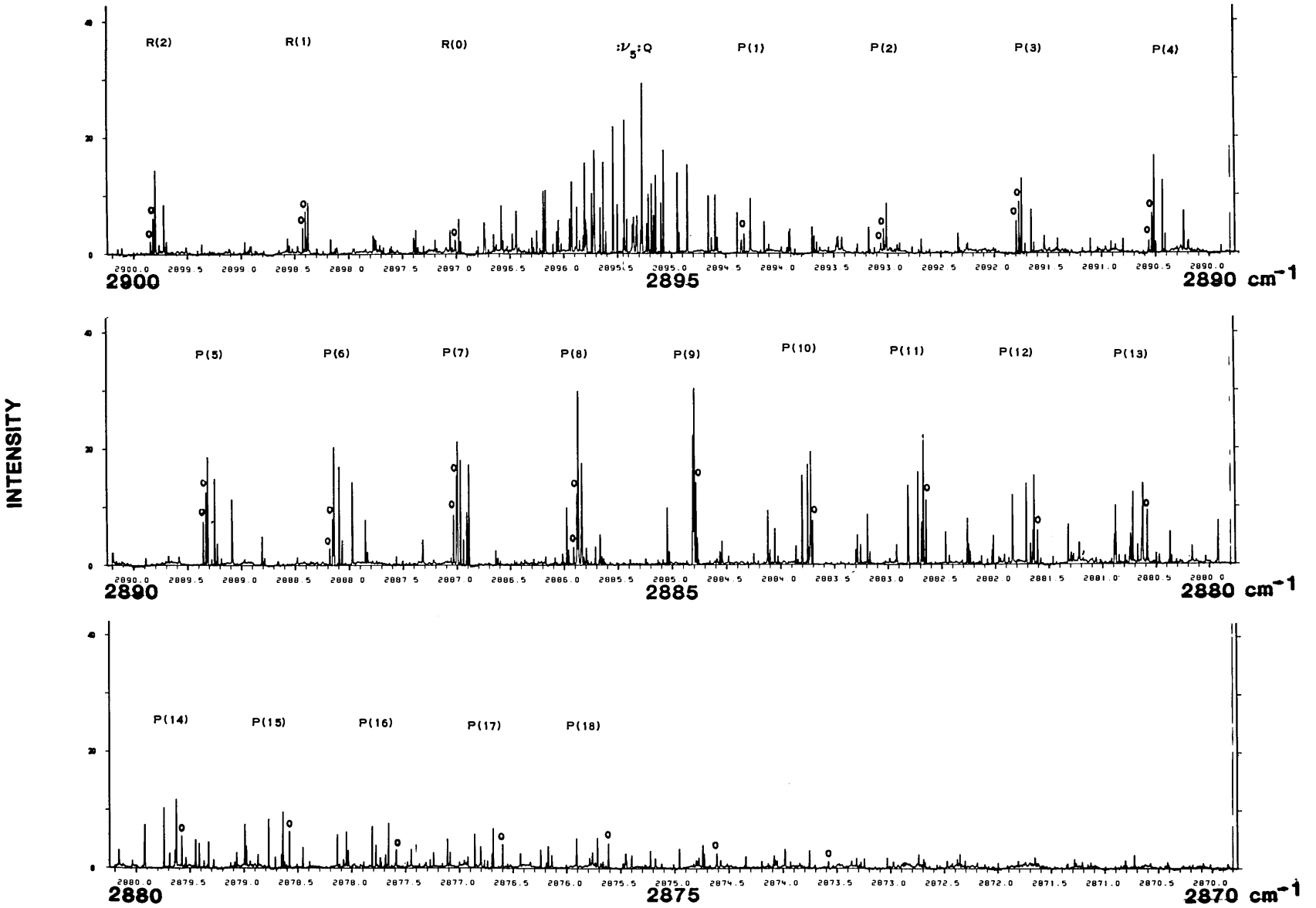

FIGURE 6. Continued

TABLE 2.

WAVENUMBER (CM-1)	INT	JU	KU	JL	KL	SYM	BAND	E LOWER (CM-1)
3051.2691	7.7	18	11	17	12		A	586.990
3049.9749	3.5	17	11	16	12	E3,4	A	564.504
3049.9330	7.0	17	11	16	12	A1,2	A	564.504
3049.4622	9.7							
3048.6779	6.0	16	11	15	12	E3,4	A	543.336
3048.6024	10.7	16	11	15	12	A1,2	A	543.336
3047.8123	9.7							
3047.4309	2.1	21	10	22	9	E3,4	A	551.048
3047.4130	4.0	21	10	22	9	A1,2	A	551.048
3047.3800	5.9	15	11	14	12	E3,4	A	521.485
3047.3681	11.9	15	11	14	12	A1,2	A	521.485
3046.5539	11.2							
3046.1768	1.8	22	10	21	9	E3,4	A	521.992
3046.1524	5.7	22	10	21	9	A1,2	A	521.992
3046.0787	7.6	14	13	13	12	E3,4	A	504.954
3046.0687	14.2	14	13	13	12	A1,2	A	504.954
3045.7492	8.7							
3045.2934	5.0	24	9	23	8		A	536.043
3044.9113	5.3	21	10	20	9	E3,4	A	494.247
3044.8790	9.2	21	10	20	9	A1,2	A	494.247
3044.7758	9.2	13	13	12	12	E3,4	A	487.742
3044.7665	18.4	13	13	12	12	A1,2	A	487.742
3044.4813	14.6							
3044.0113	6.4	23	9	22	8		A	505.677
3043.9883	16.1							
3043.6437	6.2	20	10	19	9	E3,4	A	467.814
3043.5998	11.9	20	10	19	9	A1,2	A	467.814
3043.2140	17.8							
3042.7290	9.7	22	9	21	8	G	A	476.620
3042.7191	2.9	22	9	21	8	E1	A	476.620
3042.6179	5.6	14	12	13	11	E1	A	443.592
3042.5400	18.6	14	12	13	11	G	A	443.592
3042.3869	7.4	19	10	18	9	E3,4	A	442.695
3042.3158	16.3	19	10	18	9	A1,2	A	442.695
3041.9583	19.1							
3041.4431	11.9	21	9	20	8	G	A	448.874
3041.4333	2.5	21	9	20	8	E1	A	448.874
3041.3236	7.2	13	12	12	11	E1	A	426.379
3041.3042	27.2	13	12	12	11	G	A	426.379
3041.1979	7.6	18	10	17	9	E3,4	A	418.891
3041.0281	20.4	18	10	17	9	A1,2	A	418.891
3040.7335	19.7							
3040.1560	15.2	20	9	19	8	G	A	422.440
3040.1480	3.5	20	9	19	8	E1	A	422.440
3040.0236	7.9	12	12	11	11	E1	A	410.488
3040.0154	32.8	12	12	11	11	G	A	410.488
3039.7484	22.8	17	10	16	9	A1,2	A	396.403
3039.5666	16.0	17	10	16	9	E3,4	A	396.403
3039.2599	9.7							
3039.0018	7.7	14	11	13	10	E1	A	387.555
3038.9487	22.1	14	11	13	10	G	A	387.555
3038.8677	25.5	19	9	18	8	G	A	397.321
3038.8594	7.2	19	9	18	8	E1	A	397.321
3038.4649	13.2							
3038.4336	38.4	16	10	15	9	A1,2	A	375.233
3038.3928	17.8	16	10	15	9	E3,4	A	375.233
3038.0132	18.9							
3037.9593	10.8							
3037.7741	10.2	13	11	12	10	E1	A	370.342
3037.7600	38.2	13	11	12	10	G	A	370.342
3037.5786	33.4	18	9	17	8	G	A	373.516
3037.5711	10.2	18	9	17	8	E1	A	373.516
3037.3954	8.7							
3037.1415	48.0	15	10	14	9	A1,2	A	355.380
3037.1209	22.3	15	10	14	9	E3,4	A	355.380
3036.8672	15.8							
3036.6842	12.4	23	7	22	6		A	430.934
3036.5135	59.3	12	11	11	10		A	354.451
3036.3652	10.0							
3036.2853	40.2	17	9	16	8	G	A	351.028
3036.2783	9.9	17	9	16	8	E1	A	351.028
3036.0484	9.4							
3035.8446	56.3	14	10	13	9	A1,2	A	336.847
3035.8347	27.8	14	10	13	9	E3,4	A	336.847
3035.4087	14.9	22	7	21	6		A	401.875
3035.3680	8.1	19	8	18	7	E1	A	357.280
3035.2742	28.5	19	8	18	7	G	A	357.280
3035.2387	61.1	11	11	10	10	G	A	339.880
3035.2301	17.1	11	11	10	10	E1	A	339.880
3034.9923	50.1	16	9	15	8	G	A	329.857
3034.9855	13.7	16	9	15	8	E1	A	329.857
3034.7977	6.7	26	5	25	4		A	472.566
3034.6627	11.9							
3034.5445	77.1	13	10	12	9		A	319.634
3034.1343	19.7	21	7	20	6		A	374.128
3034.0805	9.9	18	8	17	7	E1	A	333.475
3034.0319	38.0	18	3	17	7	G	A	333.475
3033.6971	61.3	15	9	14	8	G	A	310.004
3033.6902	16.0	15	9	14	8	E1	A	310.004
3033.4664	8.2	25	5	24	4		A	439.582
3033.2957	15.0							
3033.2438	113.0	12	10	11	9		A	303.742
3032.8586	24.9	20	7	19	6		A	347.694
3032.7935	12.6	17	8	16	7	E1	A	310.986
3032.7617	48.0	17	8	16	7	G	A	310.986
3032.4002	72.2	14	9	13	8	G	A	291.470
3032.3933	18.6	14	9	13	8	E1	A	291.470
3032.2550	8.7							
3032.1303	9.4	24	5	23	4		A	407.905
3031.9938	17.1							
3031.9399	96.8	11	10	10	9		A	289.171
3031.5842	31.8	19	7	18	6		A	322.573
3031.5061	13.1	16	8	15	7	E1	A	289.814
3031.4805	61.0	16	8	15	7	G	A	289.814
3031.1015	88.8	13	9	12	8	G	A	274.257
3031.0945	23.1	13	9	12	8	E1	A	274.257
3030.8036	15.0	23	5	22	4		A	377.535
3030.7525	13.7							
3030.7362	10.2							
3030.6425	53.2	10	10	9	9	E3,4	A	275.923
3030.6351	105.4	10	10	9	9	A1,2	A	275.923
3030.4022	23.8	20	6	19	5		A	318.325
3030.3170	18.8	18	7	17	6	E3,4	A	298.768
3030.3114	39.7	18	7	17	6	A1,2	A	298.768
3030.2147	19.9	15	8	14	7	E1	A	269.961
3030.1954	79.1	15	8	14	7	G	A	269.961
3029.9528	9.7	25	4	24	3		A	420.891
3029.8013	107.2	12	9	11	8	G	A	258.364
3029.7945	28.5	12	9	11	8	E1	A	258.364
3029.4703	23.6	22	5	21	4		A	348.476
3029.2557	14.2							
3029.0961	8.9	19	6	18	5	E1	A	293.203
3029.0860	39.7	19	6	18	5	G	A	293.203
3029.0549	24.1	17	7	16	6	E3,4	A	276.278
3029.0373	54.3	17	7	16	6	A1,2	A	276.278
3028.9235	24.6	14	8	13	7	E1	A	251.426
3028.9078	95.8	14	8	13	7	G	A	251.426
3028.6310	12.4	24	4	23	3		A	389.213
3028.4994	127.1	11	9	10	8	G	A	243.793
3028.4920	33.4	11	9	10	8	E1	A	243.793
3028.1424	30.1	21	5	20	4		A	320.728
3027.8385	8.7	26	3	25	2		A	440.525
3027.7721	64.0	16	7	15	6	A1,2	A	255.106
3027.7575	14.1	18	6	17	5	E1	A	269.398
3027.7453	39.1	16	7	15	6	E3,4	A	255.106
3027.7385	53.8	18	6	17	5	G	A	269.398
3027.6297	30.3	13	8	12	7	E1	A	234.212
3027.6153	116.9	13	8	12	7	G	A	234.212
3027.5261	3.4	14	13	14	12		A	523.485
3027.5020	3.4	15	13	15	12		A	543.336
3027.4748	4.0	16	13	16	12		A	564.504
3027.4383	4.0	18	13	18	12		A	610.791
3027.3105	17.3	23	4	22	3		A	358.844
3027.1956	146.6	10	9	9	8	G	A	230.544
3027.1881	36.5	10	9	9	8	E1	A	230.544
3026.8133	39.7	20	5	19	4		A	294.293
3026.5966	15.8							
3026.5300	9.5	25	3	24	2		A	407.540
3026.4804	42.4	15	7	14	6	E3,4	A	235.252
3026.4576	70.4	15	7	14	6	A1,2	A	235.252
3026.4038	18.3	17	6	16	5	E1	A	246.908
3026.3871	69.2	17	6	16	5	G	A	246.908
3026.3344	34.7	12	8	11	7	E1	A	218.319
3026.3222	135.3	12	8	11	7	G	A	218.319
3026.2828	18.8							
3026.2606	10.2							
3025.9869	22.8	22	4	21	3	A1,2	A	329.785
3025.9267	11.1	22	4	21	3	E3,4	A	329.785
3025.8900	161.5	9	9	8	8	G	A	218.619
3025.8812	43.8	9	9	8	8	E1	A	218.619
3025.4842	50.1	19	5	18	4		A	269.172
3025.2119	50.8	14	7	13	6	E3,4	A	216.718
3025.2038	102.8	14	7	13	6	A1,2	A	216.718
3025.0502	23.3	16	6	15	5		A	225.735
3025.0365	121.0							
3025.0266	157.1	11	8	10	7		A	203.748
3024.8518	10.2							
3024.7881	9.5							
3024.7513	10.7							
3024.6813	29.7	21	4	20	3	A1,2	A	302.036
3024.6492	15.9	21	4	20	3	E3,4	A	302.036
3024.1565	65.3	18	5	17	4		A	245.365
3023.9427	59.5	13	7	12	6	E3,4	A	199.504
3023.9370	121.8	13	7	12	6	A1,2	A	199.504
3023.8933	17.9	23	3	22	2		A	345.492
3023.7388	46.7	10	8	9	7	E1	A	190.499
3023.7288	183.9	10	8	9	7	G	A	190.499
3023.7013	27.7	15	6	14	5	E1	A	205.881
3023.6881	107.2	15	6	14	5	G	A	205.881
3023.3492	40.0	20	4	19	3	A1,2	A	275.601
3023.3300	18.8	20	4	19	3	E3,4	A	275.601
3023.2886	24.4							
3023.2822	12.4							
3022.8285	81.1	17	5	16	4		A	222.875
3022.6699	147.3	12	7	11	6		A	183.610
3022.4375	53.4	9	8	8	7	E1	A	178.573
3022.4277	209.7	9	8	8	7	G	A	178.573
3022.3529	33.7	14	6	13	5	E1	A	187.346
3022.3418	130.4	14	6	13	5	G	A	187.346
3022.0287	51.7	19	4	18	3	A1,2	A	250.479
3022.0114	25.0	19	4	18	3	E3,4	A	250.479
3021.8236	24.8							
3021.8150	12.4							
3021.5012	102.0	16	5	15	4		A	201.703
3021.4051	176.0	11	7	10	6		A	169.039
3021.2567	30.3	21	3	20	2		A	288.684
3021.1336	61.0	8	8	7	7	E1	A	167.971
3021.1247	235.7	8	8	7	7	G	A	167.971
3021.0080	40.4	13	6	12	5	E1	A	170.132
3020.9974	154.8	13	6	12	5	G	A	170.132
3020.7074	66.2	18	4	17	3	A1,2	A	226.672
3020.6935	34.3	18	4	17	3	E3,4	A	226.672
3020.6622	4.3	11	11	11	10		A	354.451
3020.6134	7.7	12	11	12	10		A	370.342
3020.5859	13.9							
3020.5513	1.5	13	11	13	10	E1	A	387.555
3020.5371	7.7	13	11	13	10	G	A	387.555
3020.4025	5.2	14	11	14	10		A	406.088
3020.3558	23.0							
3020.3445	11.4							
3020.1746	123.9	15	5	14	4		A	181.848
3020.1431	205.9	10	7	9	6		A	155.789
3019.9418	40.2	20	3	19	2		A	262.248
3019.6648	47.9	12	6	11	5	E1	A	154.238
3019.6548	181.1	12	6	11	5	G	A	154.238
3019.4428	9.2							
3019.3853	85.6	17	4	16	3	A1,2	A	204.182
3019.3742	43.6	17	4	16	3	E3,4	A	204.182
3019.0221	13.6	22	2	21	1		A	308.421
3018.8844	243.2	9	7	8	6		A	143.863
3018.8475	147.8	14	5	13	4		A	163.313
3018.6256	51.8	19	3	18	2		A	237.127
3018.5287	14.6							
3018.3242	55.6	11	6	10	5	E1	A	139.666
3018.3156	217.3	11	6	10	5	G	A	139.666
3018.0628	109.9	16	4	15	3	A1,2	A	183.009
3018.0521	53.8	16	4	15	3	E3,4	A	183.009
3017.7987	28.0	21	2	20	1		A	280.673
3017.6320	270.2	8	7	7	6		A	133.261
3017.5204	177.9	13	5	12	4		A	146.098
3017.3905	4.8	10	10	10	9	E3,4	A	289.171
3017.3830	9.5	10	10	10	9	A1,2	A	289.171
3017.3637	21.5	11	10	11	9		A	303.742
3017.3436	25.6	12	10	12	9		A	319.634
3017.3205	21.5	13	10	13	9		A	336.847
3017.3099	68.5	18	3	17	2?		A	213.320
3017.3036	19.1							
3017.2980	18.1	14	10	14	9	A1,2	A	355.380
3017.2874	9.2	14	10	14	9	E3,4	A	355.380
3017.2705	16.5	15	10	15	9	A1,2	A	375.233
3017.2505	8.4	15	10	15	9	E3,4	A	375.233
3017.2405	15.0	16	10	16	9	A1,2	A	396.403
3017.2330	11.8	17	10	17	9		A	418.891
3017.2089	12.6	23	1	22	0		A	334.811
3017.1997	7.5	16	10	16	9	E3,4	A	396.403
3017.1916	11.2	18	10	18	9		A	442.695
3017.1648	3.9	20	10	20	9	E3,4	A	494.247
3017.1573	9.2	19	10	19	9		A	467.814
3017.1204	6.6	20	10	20	9	A1,2	A	494.247
3017.1104	2.9	21	10	21	9	E3,4	A	521.992
3017.0791	5.0	21	10	21	9	A1,2	A	521.992
3016.9853	62.8	10	6	9	5	E1	A	126.417
3016.9772	247.4	10	6	9	5	G	A	126.417
3016.7402	129.6	15	4	14	3	A1,2	A	163.155
3016.7308	65.5	15	4	14	3	E3,4	A	163.155
3016.5104	38.1	20	2	19	1		A	254.237
3016.4819	9.2							
3016.4302	10.6							
3016.3918	156.1	7	7	6	6	E3,4	A	123.983
3016.3856	309.6	7	7	6	6	A1,2	A	123.983
3016.1942	209.2	12	5	11	4		A	130.204
3015.9928	83.3	17	3	16	2	G	A	190.829
3015.9848	21.6	17	3	16	2	E1	A	190.829
3015.8879	31.0	22	1	21	0		A	305.751
3015.7100	9.7							
3015.6484	73.0	9	6	8	5	E1	A	114.490
3015.6402	282.4	9	6	8	5	G	A	114.490
3015.4176	154.1	14	4	13	3	A1,2	A	144.619
3015.4089	77.4	14	4	13	3	E3,4	A	144.619
3015.2035	51.1	19	2	18	1		A	229.115
3015.1562	9.4	24	0	23	1		A	367.851
3014.8669	239.5	11	5	10	4		A	115.632
3014.6786	104.1	16	3	15	2	G	A	169.656
3014.6674	26.8	16	3	15	2	E1	A	169.656
3014.5647	23.9	21	1	20	0		A	278.002
3014.3802	10.7							
3014.3124	81.9	8	6	7	5	E1	A	103.888
3014.3041	311.2	8	6	7	5	G	A	103.888
3014.0945	182.1	13	4	12	3	A1,2	A	127.404
3014.0863	93.5	13	4	12	3	E3,4	A	127.404
3013.9618	16.5	9	9	9	8	G	A	230.544
3013.9537	4.5	9	9	9	8	E1	A	230.544
3013.9425	26.8	10	9	10	8	G	A	243.793
3013.9343	7.6	10	9	10	8	E1	A	243.793
3013.9217	33.8	11	9	11	8	G	A	258.364
3013.9141	8.1	11	9	11	8	E1	A	258.364
3013.8995	34.7	12	9	12	8		A	274.257
3013.8913	80.1	18	2	17	1?		A	205.308
3013.8763	33.9	13	9	13	8	G	A	291.470
3013.8689	13.6	13	9	13	8	E1	A	291.470
3013.8510	33.5	14	9	14	8		A	310.004
3013.8442	8.9							
3013.8380	13.2							
3013.8263	28.8	15	9	15	8	G	A	329.857
3013.8195	8.0	15	9	15	8	E1	A	329.857
3013.7978	24.5	16	9	16	8	G	A	351.028
3013.7910	6.4	16	9	16	8	E1	A	351.028
3013.7692	19.8	17	9	17	8	G	A	373.516
3013.7624	5.6	17	9	17	8	E1	A	373.516
3013.7392	16.4	18	9	18	8	G	A	397.321
3013.7310	4.5	18	9	18	8	E1	A	397.321
3013.7073	12.9	19	9	19	8	G	A	422.440
3013.6989	3.9	19	9	19	8	E1	A	422.440
3013.6738	10.6	20	9	20	8	G	A	448.874
3013.6659	4.3	20	9	20	8	E1	A	448.874
3013.6409	7.5	21	9	21	8	G	A	476.620
3013.6323	2.2	21	9	21	8	E1	A	476.620
3013.5998	8.4							
3013.5706	4.8	23	9	23	8		A	536.043
3013.5415	274.0	10	5	9	4		A	102.383
3013.3705	118.8	15	3	14	2	G	A	149.801
3013.3519	32.3	15	3	14	2	E1	A	149.801
3013.2408	68.2	20	1	19	0		A	251.566
3013.0501	11.3							
3012.9782	87.8	7	6	6	5	E1	A	94.610
3012.9707	339.4	7	6	6	5	G	A	94.610
3012.8513	9.7							
3012.7718	216.2	12	4	11	3	A1,2	A	111.510
3012.7643	109.2	12	4	11	3	E3,4	A	111.510
3012.5744	84.4	17	2	16	1		A	182.817
3012.5180	20.4	22	0	21	1		A	308.421
3012.2835	8.5							
3012.2138	306.1	9	5	8	4		A	90.456
3012.0821	117.6	14	3	13	2	G	A	131.266
3012.0376	38.0	14	3	13	2	E1	A	131.266
3011.9159	39.6	19	1	18	0		A	226.444
3011.7919	36.5							
3011.7224	10.9							
3011.6448	94.7	6	6	5	5	E1	A	86.656
3011.6368	374.7	6	6	5	5	G	A	86.656
3011.4472	245.4	11	4	10	3	A1,2	A	96.938
3011.4404	122.3	11	4	10	3	E3,4	A	96.938
3011.2576	101.7	16	2	15	1		A	161.644
3011.2035	27.5	21	0	20	1		A	280.673
3010.9652	9.0							
3010.8890	327.7	8	5	7	4	G	A	79.853
3010.8833	132.8	8	5	7	4	E1	A	79.853
3010.7345	39.2	13	3	12	2	E1	A	114.051
3010.6233	135.0	13	3	12	2	G	A	114.051
3010.5918	97.9	18	1	17	0		A	202.637
3010.5294	6.6	8	8	8	7	E1	A	178.573
3010.5206	26.1	8	8	8	7	G	A	178.573
3010.5081	10.6	9	8	9	7	E1	A	190.499
3010.4994	43.2	9	8	9	7	G	A	190.499
3010.4856	14.2	10	8	10	7	E1	A	203.748
3010.4744	54.0	10	8	10	7	G	A	203.748
3010.4587	13.1	11	8	11	7	E1	A	218.319
3010.4475	57.0	11	8	11	7	G	A	218.319
3010.4325	13.7	12	8	12	7	E1	A	234.212
3010.4201	54.5	12	8	12	7	G	A	234.212
3010.4028	11.8	13	8	13	7	E1	A	251.426
3010.3892	52.3	13	8	13	7	G	A	251.426
3010.3732	10.7	14	8	14	7	E1	A	269.961
3010.3577	46.2	14	8	14	7	G	A	269.961
3010.3417	9.7	15	8	15	7	E1	A	289.814
3010.3224	41.7	15	8	15	7	G	A	289.814
3010.3112	8.2	16	8	16	7	E1	A	310.986
3010.2849	36.5	16	8	16	7	G	A	310.986
3010.2749	8.7	17	8	17	7	E1	A	333.475
3010.2424	34.7	17	8	17	7	G	A	333.475
3010.2095	12.1							
3010.1916	24.0	18	8	18	7		A	357.280
3010.1311	14.4							
3010.1231	242.7	10	4	9	3	A1,2	A	83.688
3010.1169	141.4	10	4	9	3	E3,4	A	83.688
3009.9458	31.8	15	2	14	1	E1	A	141.789
3009.9396	121.5	15	2	14	1	G	A	141.789
3009.8815	13.9	20	0	19	1?	E1	A	254.237
3009.8720	30.6	20	0	19	1	G	A	254.237
3009.7747	14.4							
3009.6446	10.2							
3009.5629	362.8	7	5	6	4		A	70.575
3009.4763	25.9	12	3	11	2	E1	A	98.157
3009.3813	9.7							
3009.3424	197.3	12	3	11	2	G	A	98.157
3009.2662	62.3	17	1	16	0		A	180.147
3009.2594	26.4							
3009.1960	9.7							
3009.1824	13.7							
3009.0555	11.8							
3008.8075	8.7							
3008.7995	301.7	9	4	8	3	A1,2	A	71.762
3008.7933	151.9	9	4	8	3	E3,4	A	71.762
3008.7091	11.3							
3008.6202	144.2	14	2	13	1		A	123.254
3008.5696	11.2							
3008.5583	12.1	19	0	18	1?	E1	A	229.115
3008.5508	39.5	19	0	18	1	G	A	229.115
3008.3263	12.1							
3008.3174	8.7							
3008.2357	384.3	6	5	5	4		A	62.621
3008.0330	228.2	11	3	10	2	G	A	83.584
3008.0074	55.1	11	3	10	2	E1	A	83.584
3007.9418	146.0	16	1	15	0		A	158.973
3007.8868	19.9							
3007.5030	9.7							
3007.4747	329.2	8	4	7	3	A1,2	A	61.159
3007.4685	166.7	8	4	7	3	E3,4	A	61.159
3007.3055	40.9	13	2	12	1	E1	A	106.038
3007.2991	174.2	13	2	12	1	G	A	106.038
3007.2277	50.1	18	0	17	17		A	205.308
3007.1126	19.8	7	7	7	6	E3,4	A	133.261
3007.1063	40.9	7	7	7	6	A1,2	A	133.261
3007.0319	30.3	8	7	8	6	E3,4	A	143.863
3007.0270	63.5	8	7	8	6	A1,2	A	143.863
3007.0047	12.9							
3006.9556	78.4	9	7	9	6		A	155.789
3006.9093	400.2	5	5	4	4		A	55.992
3006.8893	84.4	10	7	10	6		A	169.039
3006.8262	85.8	11	7	11	6		A	183.610
3006.7676	85.8	12	7	12	6		A	199.504
3006.7161	293.5	10	3	9	2?	G	A	70.334
3006.7099	71.1	13	7	13	6		A	216.718
3006.7036	65.4	10	3	9	2?	E1	A	70.334
3006.6611	32.7	14	7	14	6	E3,4	A	235.252
3006.6530	62.0	14	7	14	6	A1,2	A	235.252
3006.6162	93.1	15	1	14	0?		A	139.118
3006.6070	30.2	15	7	15	6	E3,4	A	255.106
3006.5841	48.9	15	7	15	6	A1,2	A	255.106
3006.5755	46.6	16	7	16	6	A1,2	A	276.278
3006.5483	23.5	16	7	16	6	E3,4	A	276.278
3006.5360	17.4	17	7	17	6	E3,4	A	298.768
3006.5185	37.0	17	7	17	6	A1,2	A	298.768
3006.4754	15.0	18	7	18	6	E3,4	A	322.573
3006.4691	30.2	18	7	18	6	A1,2	A	322.573
3006.4217	24.5	19	7	19	6		A	347.694
3006.3748	19.1	20	7	20	6		A	374.128
3006.3290	14.9	21	7	21	6		A	401.875
3006.2840	11.4	22	7	22	6		A	430.934
3006.2396	8.0	23	7	23	6		A	461.302
3006.1933	13.4							
3006.1509	356.4	7	4	6	3	A1,2	A	51.880
3006.1440	187.0	7	4	6	3	E3,4	A	51.880
3005.9839	57.4	12	2	11	1	E1	A	90.144
3005.9777	193.3	12	2	11	1	G	A	90.144
3005.9045	62.6	17	0	16	1		A	182.817
3005.3959	288.6	9	3	8	2	G	A	58.408
3005.3873	72.1	9	3	8	2	E1	A	58.408
3005.2904	169.2	14	1	13	0		A	120.583
3005.2507	31.6	19	1	18	2		A	237.127
3004.8809	10.6							
3004.8253	375.4	6	4	5	3	A1,2	A	43.926
3004.8191	190.5	6	4	5	3	E3,4	A	43.926
3004.6554	227.4	11	2	10	1		A	75.572
3004.6440	15.2							
3004.5813	75.8	16	0	15	1		A	161.644
3004.2161	9.0							
3004.1874	13.7							
3004.1695	13.6							
3004.1359	10.0							
3004.0749	304.4	8	3	7	2	G	A	47.805
3004.0675	81.1	8	3	7	2	E1	A	47.805
3003.9649	120.6	13	1	12	0		A	103.367
3003.9279	41.2							
3003.9217	31.7							
3003.9161	30.0							
3003.8958	44.1	18	6	18	5		A	293.203
3003.8828	15.5	17	6	17	5	E1	A	269.398
3003.8667	54.3	17	6	17	5	G	A	269.398
3003.8531	17.6	16	6	16	5	E1	A	246.908
3003.8389	68.3	16	6	16	5	G	A	246.908
3003.8253	25.0	15	6	15	5	E1	A	225.735
3003.8128	83.2	15	6	15	5	G	A	225.735
3003.8009	25.6	14	6	14	5	E1	A	205.881
3003.7897	96.0	14	6	14	5	G	A	205.881
3003.7796	28.1	13	6	13	5	E1	A	187.346
3003.7699	109.7	13	6	13	5	G	A	187.346
3003.7607	31.5	12	6	12	5	E1	A	170.132
3003.7516	123.0	12	6	12	5	G	A	170.132
3003.7449	33.2	11	6	11	5	E1	A	154.238
3003.7357	131.9	11	6	11	5	G	A	154.238
3003.7222	140.0	10	6	10	5		A	139.666
3003.7105	147.4	9	6	9	5		A	126.417
3003.6994	143.4	8	6	8	5		A	114.490
3003.6907	112.4	7	6	7	5		A	103.888
3003.6827	61.5	6	6	6	5		A	94.610
3003.5661	10.9							
3003.5478	9.7							
3003.5005	385.9	5	4	4	3	A1,2	A	37.297
3003.4943	197.2	5	4	4	3	E3,4	A	37.297
3003.3337	239.0	10	2	9	1		A	62.322
3003.3263	19.6							
3003.3177	10.7							
3003.2578	92.5	15	0	14	1		A	141.789
3003.0919	9.9							
3002.8191	11.1							
3002.7528	328.0	7	3	6	2	G	A	38.526
3002.7460	83.7	7	3	6	2	E1	A	38.526
3002.6392	238.7	12	1	11	0		A	87.473
3002.6031	51.8	17	1	16	2		A	190.829
3002.2510	16.3							
3002.1750	393.3	4	4	3	3	A1,2	A	31.994
3002.1688	200.9	4	4	3	3	E3,4	A	31.994
3002.0164	68.5							
3002.0102	250.8	9	2	8	1		A	50.395
3001.9966	12.2	19	2	18	3	E3,4	A	250.479
3001.9898	24.1	19	2	18	3	A1,2	A	250.479
3001.9336	107.8	14	0	13	1		A	123.254
3001.5016	10.6							
3001.4297	337.6	6	3	5	2	G	A	30.572
3001.4228	86.6	6	3	5	2	E1	A	30.572
3001.3140	146.9	11	1	10	0		A	72.901
3001.2796	68.5	16	1	15	2		A	169.656
3000.9559	9.2							
3000.6879	270.2	8	2	7	1		A	39.792
3000.6679	33.7	18	2	17	3		A	226.672
3000.6082	122.5	13	0	12	1		A	106.038
3000.3995	16.4							
3000.3822	11.3							
3000.3649	9.5							
3000.3562	16.1							
3000.3426	20.6							
3000.3352	29.7	21	5	21	4?		A	348.476
3000.3272	37.7	20	5	20	4?		A	320.728
3000.3198	48.8	19	5	19	4?		A	294.293
3000.3136	65.5	18	5	18	4?		A	269.172
3000.3081	90.4	17	5	17	4?		A	245.365
3000.1827	10.0							
3000.1239	8.9							
3000.1055	132.8	5	3	4	2	G	A	23.943
3000.0992	97.5	5	3	4	2	E1	A	23.943
2999.9876	270.8	10	1	9	0		A	59.651
2999.9551	88.4	15	1	14	2		A	149.801
2999.8794	8.4							
2999.6583	8.9							
2999.3816	8.9							
2999.3637	272.1	7	2	6	1		A	30.513
2999.3353	25.8							
2999.3260	14.2	17	2	16	3	A1,2	A	204.182
2999.3070	2.7	17	2	16	3?	E3,4	A	204.182
2999.2848	138.2	12	0	11	1		A	90.144
2998.8633	10.2							
2998.7813	334.5	4	3	3	2	G	A	18.640
2998.7751	83.8	4	3	3	2	E1	A	18.640
2998.6615	162.8	9	1	8	0		A	47.724
2998.6294	103.0	14	1	13	2		A	131.266
2998.3626	8.4							
2998.0627	8.7							
2998.0392	273.6	6	2	5	1		A	22.559
2998.0168	17.1	16	2	15	3	E3,4	A	183.009
2998.0095	33.4	16	2	15	3	A1,2	A	183.009
2997.9605	151.7	11	0	10	1		A	75.572
2997.5446	11.6							
2997.5336	9.0							
2997.4567	329.6	3	3	2	2	G	A	14.662
2997.4503	83.2	3	3	2	2	E1	A	14.662
2997.4421	22.6							
2997.3360	277.9	8	1	7	0		A	37.121
2997.3046	114.8	13	1	12	2		A	114.051
2996.9483	12.7							
2996.9384	14.1							
2996.9310	10.6							
2996.9216	12.2							
2996.8969	21.5							
2996.7982	12.4							
2996.7435	9.2							
2996.7152	252.4	5	2	4	1		A	15.930
2996.6797	48.1	15	2	14	3	A1,2	A	163.155
2996.6683	27.2	15	2	14	3	E3,4	A	163.155
2996.6348	152.6	10	0	9	1		A	62.322
2996.6055	26.8							
2996.5015	4.3	7	7	8	6		A	143.863
2996.1144	28.6	17	3	16	4	G	A	222.875
2996.0950	7.6	17	3	16	4	E1	A	222.875
2996.0093	152.6	7	1	6	0		A	27.842
2995.9775	117.4	12	1	11	2		A	98.157
2995.4234	9.2							
2995.3901	229.0	4	2	3	1		A	10.627
2995.3530	61.6	14	2	13	3		A	144.619
2995.3109	155.4	9	0	8	1		A	50.395
2995.0973	6.4	8	7	9	6		A	155.789
2994.7804	33.4	16	3	15	4	G	A	201.703
2994.7651	9.7	16	3	15	4	E1	A	201.703
2994.6893	142.6	6	1	5	0	E4	A	19.888
2994.6837	237.9	6	1	5	0	A2	A	19.888
2994.6521	121.6	11	1	10	2		A	83.584
2994.6350	10.7							
2994.2340	13.6	18	4	17	5	G	A	269.398
2994.2215	5.5	18	4	17	5	E1	A	269.398
2994.0652	240.1	3	2	2	1		A	6.649
2994.0239	75.8	13	2	12	3		A	127.404
2993.9851	161.6	8	0	7	1		A	39.792
2993.8683	14.4							
2993.7003	8.5	9	7	10	6		A	169.039
2993.6527	56.3							
2993.5712	46.2	12	3	12	2	E1	A	114.051
2993.5530	9.4							
2993.5286	140.8	14	3	14	2		A	149.801
2993.5049	48.5	13	3	13	2	E1	A	131.266
2993.4936	150.2	15	3	15	2		A	169.656
2993.4599	487.1	10	3	10	2		A	83.584
2993.4517	347.6	11	3	11	2		A	98.157
2993.4367	242.5	12	3	12	2	G	A	114.051
2993.4261	64.5							
2993.3933	159.7	13	3	13	2	G	A	131.266
2993.3573	157.5	5	1	4	0?		A	13.259
2993.3267	128.3	10	1	9	2		A	70.334
2993.3167	10.6							
2993.2385	45.4							
2993.1747	34.0							

TABLE 2. *continued*

WAVENUMBER (CM-1)	INT	JU	KU	JL	KL	SYM	BAND	E LOWER (CM-1)
2993.1653	21.5							
2993.0853	9.9	7	6	8	5		A	114.490
2992.9752	11.8							
2992.9077	17.1	17	4	16	5	G	A	246.908
2992.8946	4.5	17	4	16	5	E1	A	246.908
2992.7399	221.6	2	2	1	1		A	3.997
2992.6963	91.4	12	2	11	3		A	111.510
2992.6594	160.3	7	0	6	1		A	30.513
2992.3094	11.2	10	7	11	6		A	183.610
2992.1692	18.8							
2992.1041	9.4	14	3	13	4	E1	A	163.313
2992.0779	20.4	14	3	13	4	G	A	163.313
2992.0366	125.3	4	1	3	0	E4	A	7.956
2992.0310	211.9	4	1	3	0	A2	A	7.956
2992.0006	121.5	9	1	8	2		A	58.408
2991.8528	1.8	13	8	14	7	E1	A	269.961
2991.8396	7.4	13	8	14	7	G	A	269.961
2991.7771	4.2	8	6	9	5	E1	A	126.417
2991.7690	15.4	8	6	9	5	G	A	126.417
2991.5952	11.3							
2991.5405	10.6							
2991.3683	97.0	11	2	10	3		A	96.938
2991.3341	148.7	6	0	5	1		A	22.559
2991.0010	15.9	6	5	7	4		A	79.853
2990.9229	12.7	11	7	12	6		A	199.504
2990.7901	44.4	13	3	12	4	G	A	146.098
2990.7740	12.7	13	3	12	4	E1	A	146.098
2990.7107	37.6	3	1	2	0	E3	A	3.978
2990.7044	107.8	3	1	2	0	A1	A	3.978
2990.6759	116.1	8	1	7	2		A	47.805
2990.4845	9.7	14	8	15	7		A	289.814
2990.4626	6.2	9	6	10	5	E1	A	139.666
2990.4539	19.6	9	6	10	5	G	A	139.666
2990.3137	9.2							
2990.2413	31.7	15	4	14	5	G	A	205.881
2990.2344	10.6	15	4	14	5	E1	A	205.881
2990.2000	8.7							
2990.1373	46.1							
2990.1168	14.7							
2990.1018	10.8							
2990.0515	113.4	17	2	17	1?		A	205.308
2990.0465	102.6							
2990.0389	122.3	10	2	9	3?		A	83.688
2990.0218	50.1							
2990.0082	128.0	5	0	4	1		A	15.930
2989.9897	36.7							
2989.8936	18.4							
2989.7513	37.7							
2989.6766	25.1	7	5	8	4		A	90.456
2989.5401	13.2	12	7	13	6		A	216.718

WAVENUMBER (CM-1)	INT	JU	KU	JL	KL	SYM	BAND	E LOWER (CM-1)
2989.4671	47.5	12	3	11	4	G	A	130.204
2989.4430	12.9	12	3	11	4	E1	A	130.204
2989.3844	84.7	2	1	1	0	E4	A	1.326
2989.3782	140.7	2	1	1	0	A2	A	1.326
2989.3504	101.5	7	1	6	2		A	38.526
2989.1510	5.9	10	6	11	5	E1	A	154.238
2989.1423	20.9	10	6	11	5	G	A	154.238
2989.1269	6.9	15	8	16	7		A	310.986
2988.9157	23.3							
2988.9064	27.0	14	4	13	5		A	187.346
2988.7974	9.5							
2988.7125	97.9	9	2	8	3		A	71.762
2988.6834	103.1	4	0	3	1		A	10.627
2988.3530	30.5	8	5	9	4		A	102.383
2988.1745	17.4	3	3	4	2		A	23.943
2988.1589	12.7	11	3	10	4?	E1	A	115.632
2988.1433	48.3	11	3	10	4	G	A	115.632
2988.1138	13.9							
2988.0582	19.6	1	1	0	0	E3	A	
2988.0513	58.4	1	1	0	0	A1	A	
2988.0238	87.3	6	1	5	2		A	30.572
2987.8395	6.5	11	6	12	5	E1	A	170.132
2987.8310	22.8	11	6	12	5	G	A	170.132
2987.7668	6.9	16	8	17	7		A	333.475
2987.5899	36.7							
2987.5830	24.8							
2987.5736	30.6	13	4	12	5		A	170.132
2987.5421	13.1							
2987.3852	93.8	8	2	7	3		A	61.159
2987.3572	71.4	3	0	2	1		A	6.649
2987.0283	38.0	9	5	10	4		A	115.632
2986.8476	33.8	4	3	5	2		A	30.572
2986.8207	48.6	10	3	9	4	G	A	102.383
2986.8077	10.4	10	3	9	4?	E1	A	102.383
2986.7849	17.8							
2986.7787	12.9							
2986.7608	36.7							
2986.6994	537.4							
2986.6925	317.3							
2986.6863	198.0							
2986.6662	12.2							
2986.5335	8.2	12	6	13	5	E1	A	187.346
2986.5236	24.3	12	6	13	5	G	A	187.346
2986.3322	28.2							
2986.3086	15.9							
2986.2635	49.3	7	4	8	3	A1,2	A	71.762
2986.2573	26.7	7	4	8	3	E3,4	A	71.762
2986.2391	29.0	12	4	11	5		A	154.238
2986.1820	11.8							
2986.1098	23.6	2	2	3	1		A	10.627

WAVENUMBER (CM-1)	INT	JU	KU	JL	KL	SYM	BAND	E LOWER (CM-1)
2986.0578	78.2	7	2	6	3		A	51.880
2986.0303	40.4	2	0	1	1		A	3.997
2985.7059	36.0	10	5	11	4		A	130.204
2985.5212	52.7	5	3	6	2	G	A	38.526
2985.5145	13.7	5	3	6	2	E1	A	38.526
2985.5046	39.2	9	3	8	4		A	90.456
2985.4550	10.6							
2985.3872	11.6							
2985.3718	46.4							
2985.2280	8.2	13	6	14	5	E1	A	205.881
2985.2174	28.3	13	6	14	5	G	A	205.881
2985.0961	8.9							
2985.0905	9.0							
2984.9385	54.5	8	4	9	3	A1,2	A	83.688
2984.9317	27.7	8	4	9	3	E3,4	A	83.688
2984.9054	26.1	11	4	10	5	G	A	139.666
2984.8929	7.6	11	4	10	5?	E1	A	139.666
2984.7891	25.9							
2984.7828	51.1	3	2	4	1?		A	15.930
2984.7308	65.0	6	2	5	3		A	43.926
2984.3923	8.9							
2984.3825	41.0	11	5	12	4		A	146.098
2984.3582	8.7							
2984.1929	69.7	6	3	7	2		A	47.805
2984.1700	8.7							
2984.1262	11.9							
2984.0812	9.7							
2984.0737	34.2							
2984.0459	22.3	3	1	2	2		A	14.662
2983.9267	4.7	14	6	15	5	E1	A	225.735
2983.9155	17.6	14	6	15	5	G	A	225.735
2983.8980	9.2							
2983.7741	8.4							
2983.6129	56.5	9	4	10	3	A1,2	A	96.938
2983.6061	28.3	9	4	10	3	E3,4	A	96.938
2983.5888	12.9							
2983.5715	25.4	10	[illegible]	9	5		A	126.617
2983.5464	11.9							
2983.4820	9.2							
2983.4568	74.2	4	2	5	1		A	22.559
2983.4013	85.1							
2983.3952	91.0							
2983.0612	37.7	12	5	13	4		A	163.313
2982.9360	24.8							
2982.9243	28.0							
2982.9125	12.4							
2982.9056	9.9							
2982.8956	25.5	7	3	6	4		A	70.575
2982.8655	77.6	7	3	8	2	G	A	58.408
2982.8586	20.9	7	3	8	2	E1	A	58.408

WAVENUMBER (CM-1)	INT	JU	KU	JL	KL	SYM	BAND	E LOWER (CM-1)
2982.8383	8.5							
2982.7955	11.8							
2982.7551	54.5	2	1	3	0	E4	A	7.956
2982.7489	88.8	2	1	3	0	A2	A	7.956
2982.6899	5.3	21	3	20	3?	E3,4	B	302.036
2982.6636	10.6	21	3	20	3?	A1,2	B	302.036
2982.6273	3.7	15	6	16	5	E1	A	246.908
2982.6155	15.5	15	6	16	5	G	A	246.908
2982.5840	8.5							
2982.5661	8.5							
2982.4761	8.4							
2982.2871	51.3	10	4	11	3	A1,2	A	111.510
2982.2803	29.5	10	4	11	3	E3,4	A	111.510
2982.2371	23.3	9	4	8	5		A	114.490
2982.2296	12.6							
1982.1295	90.0	4	2	5	1		A	22.559
2982.0989	9.7							
2982.0770	18.9	4	2	3	3		A	31.994
2982.0526	73.2	0	0	1	1		A	3.997
2982.0077	25.0							
2981.7400	32.7	13	5	14	4		A	181.848
2981.6275	9.4							
2981.5380	86.6	8	3	9	2	G	A	70.334
2981.5298	22.0	8	3	9	2	E1	A	70.334
2981.4854	9.4							
2981.4287	24.5	3	1	4	0	E3	A	13.259
2981.4223	74.0	3	1	4	0	A1	A	13.259
2981.3864	9.6							
2981.3524	9.7							
2981.3259	10.8							
2981.3185	13.9							
2981.2847	9.2	20	3	19	3	E3,4	B	275.601
2981.2659	20.6	20	3	19	3	A1,2	B	275.601
2981.2203	9.5							
2980.9627	55.3	11	4	12	3	A1,2	A	127.404
2980.9559	29.3	11	4	12	3	E3,4	A	127.404
2980.9498	13.6							
2980.9045	18.9	8	4	7	5		A	103.888
2980.8028	106.0	6	2	7	1		A	39.792
2980.7262	108.3	1	0	2	1		A	6.649
2980.6275	16.6							
2980.6219	21.2							
2980.6088	15.5							
2980.4193	30.8	14	5	15	4		A	201.703
2980.2080	86.8	9	3	10	2	G	A	83.584
2980.1988	22.3	9	3	10	2	E1	A	83.584
2980.1741	12.3							
2980.1685	9.5							
2980.1612	8.7							
2980.1502	10.2							

WAVENUMBER (CM-1)	INT	JU	KU	JL	KL	SYM	BAND	E LOWER (CM-1)
2980.1368	13.1							
2980.1203	72.5							
2980.1035	97.8	4	1	5	0?	E4	A	19.888
2980.0978	161.8	4	1	5	0?	A2	A	19.888
2980.0526	26.3							
2980.0324	18.3							
2980.0235	14.9							
2979.9468	12.7							
2979.9350	9.7							
2979.8825	11.4	19	3	18	3	E3,4	B	250.479
2979.8659	24.1	19	3	18	3	A1,2	B	250.479
2979.8496	9.0							
2979.7658	14.7							
2979.6904	9.0							
2979.6374	55.1	12	4	13	3	A1,2	A	144.619
2979.6299	26.7	12	4	13	3	E3,4	A	144.619
2979.5707	14.4	7	4	6	5		A	94.610
2979.4762	111.2	7	2	8	1		A	50.395
2979.4006	136.4	2	0	3	1		A	10.627
2979.2322	39.4	17	1	16	1		B	182.817
2979.2112	10.2							
2979.1586	17.5	17	0	16	0	A1	B	180.147
2979.1486	7.0	17	0	16	0	E3	B	180.147
2979.0994	26.7	15	5	16	4		A	222.875
2979.0865	12.9							
2978.8792	83.9	10	3	11	2	G	A	98.157
2978.8659	19.7	10	3	11	2	E1	A	98.157
2978.8365	8.6							
2978.7782	36.0	5	1	6	0	E3	A	27.842
2978.7721	104.1	5	1	6	0	A1	A	27.842
2978.6504	21.9	18	4	17	4		B	245.365
2978.6207	25.2							
2978.5376	19.9							
2978.4910	17.8							
2978.4834	15.8	18	3	17	3	E3,4	B	226.672
2978.4689	30.9	18	3	17	3	A1,2	B	226.672
2978.3225	17.6							
2978.3131	47.0	13	4	14	3	A1,2	A	163.155
2978.3042	24.0	13	4	14	3	E3,4	A	163.155
2978.1499	117.6	8	2	9	1		A	62.322
2978.0746	168.9	3	0	4	1		A	15.930
2977.9097	21.8	15	2	14	2?		B	149.801
2977.8456	48.2	16	1	15	1		B	161.644
2977.8253	14.0							
2977.7814	23.8	16	5	17	6		A	245.365
2977.7077	36.2	16	0	15	0	A2	B	158.973
2977.6969	22.0	16	0	15	0	E4	B	158.973
2977.5471	74.2	11	3	12	2	G	A	114.051
2977.5208	17.0	11	3	12	2	E1	A	114.051
2977.4516	109.4	6	1	7	0	E4	A	37.121

WAVENUMBER (CM-1)	INT	JU	KU	JL	KL	SYM	BAND	E LOWER (CM-1)
2977.4461	188.1	6	1	7	0	A2	A	37.121
2977.4164	184.0	1	1	2	2	G	A	14.662
2977.4096	46.7	1	1	2	2	E1	A	14.662
2977.2351	29.1	17	4	16	4		B	222.875
2977.2219	10.7							
2977.1984	32.8							
2977.1552	13.4							
2977.0881	19.0	17	3	16	3	E3,4	B	204.182
2977.0750	37.7	17	3	16	3	A1,2	B	204.182
2977.0625	29.1	17	6	16	6		B	276.278
2977.0387	14.5							
2976.9884	41.7	14	4	15	3	A1,2	A	183.009
2976.9798	21.0	14	4	15	3	E3,4	A	183.009
2976.9324	9.4							
2976.8768	13.5							
1976.8567	49.4							
2976.8480	24.4							
2976.8374	56.3							
2976.8292	61.7							
2976.8230	215.1	9	2	10	1?		A	75.572
2976.8176	108.6							
2976.8112	113.4							
2976.7488	176.5	4	0	5	1		A	22.559
2976.6351	29.0	14	2	13	2		B	131.266
2976.6265	10.8							
2976.4772	18.5							
2976.4640	18.1							
2976.4578	45.0	15	1	14	1?		B	141.789
2976.4415	15.7							
2976.3426	16.3	12	3	13	2	E1	A	131.266
2976.2689	26.0	15	0	14	0	A1	B	139.118
2976.2577	9.0	15	0	14	0	E3	B	139.118
2976.2077	64.8	12	3	13	2	G	A	131.266
2976.1221	118.8	7	1	8	0		A	47.724
2976.0905	197.3	2	1	3	2	G	A	18.640
2976.0835	50.3	2	1	3	2	E1	A	18.640
2975.9082	12.9							
2975.8325	15.4							
2975.8250	38.1	16	4	15	4		B	201.703
2975.7788	36.2							
2975.7675	17.9							
2975.7471	20.1							
2975.6960	24.6	16	3	15	3	E3,4	B	183.009
2975.6833	48.8	16	3	15	3	A1,2	B	183.009
2975.6649	38.0	15	4	16	3	A1,2	A	204.182
2975.6549	21.1	15	4	16	3	E3,4	A	204.182
2975.6362	35.4	16	6	15	6		B	255.106
2975.4961	108.3	10	2	11	1		A	90.144
2975.4761	11.8							
2975.4230	195.4	5	0	6	1		A	30.513

WAVENUMBER (CM-1)	INT	JU	KU	JL	KL	SYM	BAND	E LOWER (CM-1)
2975.3310	29.7	13	2	12	2?		B	114.051
2975.1869	13.2							
2975.1484	15.6	18	5	19	4		A	294.293
2975.1003	19.3							
2975.0828	69.3	14	1	13	1		B	123.254
2975.0615	23.5							
2974.9521	15.4	13	3	14	2	E1	A	149.801
2974.8939	8.7							
2974.8645	9.5							
2974.8401	97.5	13	3	14	2	G	A	149.801
2974.8295	30.6							
2974.7978	194.0	8	1	9	0		A	59.651
2974.7645	208.5	3	1	4	2	G	A	23.943
2974.7582	53.3	3	1	4	2	E1	A	23.943
2974.5924	10.9							
2974.4647	23.5							
2974.4270	14.6							
2974.4194	42.0	15	4	14	4		B	181.848
2974.3771	22.0							
2974.3655	43.4							
2974.3426	32.8	16	4	17	3	A1,2	A	226.672
2974.3315	17.9	16	4	17	3	E3,4	A	226.672
2974.3074	32.5	15	3	14	3	E3,4	B	163.155
2974.2949	59.0	15	3	14	3	A1,2	B	163.155
2974.2161	41.2	15	6	14	6		B	235.252
2974.1690	100.7	11	2	12	1		A	106.038
2974.1382	9.5							
2974.0979	189.3	6	0	7	1		A	39.792
2974.0122	33.3	12	2	11	2?		B	98.157
2974.0067	24.6							
2973.8409	12.9							
2973.8327	13.1	19	5	20	4		A	320.728
2973.7553	47.7							
2973.7047	78.4	13	1	12	1		B	106.038
2973.6812	22.5							
2973.6732	77.4							
2973.6520	49.6							
2973.6383	17.6							
2973.6301	21.1							
2973.6151	200.0							
2973.6058	59.7							
2973.5984	62.3							
2973.5923	70.0							
2973.5818	308.2							
2973.5731	186.6							
2973.5626	507.0							
2973.5516	38.6							
2973.5449	67.6							
2973.5394	55.1							
2973.5333	48.3							

WAVENUMBER (CM-1)	INT	JU	KU	JL	KL	SYM	BAND	E LOWER (CM-1)
2973.5254	114.1							
2973.5169	73.4							
2973.4990	10.8							
2973.4866	10.6							
2973.4743	111.2							
2973.4669	61.1	4	3	4	4?		A	55.992
2973.4544	10.9							
2973.4388	217.0	4	1	5	2		A	30.572
2973.4321	56.0							
2973.4231	32.4	13	0	12	0	A1	B	103.367
2973.4119	10.6	13	0	12	0	E3	B	103.367
2973.3965	80.2							
2973.3625	13.2							
2973.3038	47.7							
2973.2754	10.8							
2973.2143	14.2							
2973.2050	10.8							
2973.1767	13.4							
2973.1617	24.4							
2973.1373	29.6							
2973.0268	15.9							
2973.0192	77.2	14	4	13	4		B	163.313
2973.0074	13.6							
2972.9845	24.9							
2972.9572	50.6	14	5	13	5		B	187.346
2972.9210	35.2	14	3	13	3	E3,4	B	144.619
2972.9090	69.3	14	3	13	3	A1,2	B	144.619
2972.8919	9.7							
2972.8422	91.1	12	2	13	1		A	123.254
2972.8035	55.9							
2972.7930	357.0	2	2	3	3		A	31.994
2972.7727	192.8	7	0	8	1		A	50.395
2972.6874	36.3	11	2	10	2		B	83.584
2972.5902	29.1							
2972.5189	12.2							
2972.3307	102.3	12	1	11	1		B	90.144
2972.3056	23.0							
2972.2935	45.7	15	3	16	2	G	A	190.829
2972.2752	13.4	15	3	16	2	E1	A	190.829
2972.1506	180.8	10	1	11	0		A	87.473
2972.1368	15.0							
2972.1131	219.1	5	1	6	2		A	38.526
2972.0224	11.8							
2972.0149	67.5	12	0	11	0	A2	B	87.473
2972.0036	40.4	12	0	11	0	E4	B	87.473
2971.9755	11.1							
2971.9586	10.8							
2971.9161	11.1							
2971.8198	28.3							
2971.6972	19.7	18	4	19	3	A1,2	A	275.601

WAVENUMBER (CM-1)	INT	JU	KU	JL	KL	SYM	BAND	E LOWER (CM-1)
2971.6835	11.4	18	4	19	3	E3,4	A	275.601
2971.6322	17.1							
2971.6247	61.3	13	4	12	4		B	146.098
2971.5936	25.3							
2971.5546	57.8	13	5	12	5		B	170.132
2971.5396	38.5	13	3	12	3	E3,4	B	127.404
2971.5278	77.4	13	3	12	3	A1,2	B	127.404
2971.5159	81.9	13	2	14	1		A	141.789
2971.4683	353.8	3	2	4	3		A	37.297
2971.4471	180.2	8	0	9	1		A	62.322
2971.3954	52.4	13	6	12	6		B	199.504
2971.3602	39.4	10	2	9	2		B	70.334
2971.2076	9.2							
2971.1786	30.8							
2970.9587	119.5	11	1	10	1		B	75.572
2970.9462	11.8							
2970.9349	25.9							
2970.9124	19.4							
2970.8762	8.4							
2970.8261	96.6	11	1	12	0		A	103.367
2970.7871	218.0	6	1	7	2		A	47.805
2970.6548	13.9							
2970.6398	12.1							
2970.6148	42.5	11	0	10	0	A1	B	72.901
2970.6036	16.0	11	0	10	0	E3	B	72.901
2970.5764	24.8	13	2	12	2		B	114.051
2970.4897	18.9							
2970.4609	16.0							
2970.4115	21.6							
2970.3980	43.6							
2970.3881	54.3							
2970.3751	33.4							
2970.3665	83.4	15	4	15	5		A	225.735
2970.3548	87.9	14	4	14	5		A	205.881
2970.3463	104.5	13	4	13	5		A	187.346
2970.3359	126.1	12	4	12	5		A	170.132
2970.3261	119.5	11	4	11	5		A	154.238
2970.3164	130.2	10	4	10	5		A	139.666
2970.3071	135.9	9	4	9	5		A	126.417
2970.2990	136.5	8	4	8	5		A	114.490
2970.2921	127.7	7	4	7	5		A	103.888
2970.2852	105.5	6	4	6	5		A	94.610
2970.2796	62.8	5	4	5	5		A	86.656
2970.2425	21.3							
2970.2336	83.9	12	4	11	4		B	130.204
2970.2007	27.3	14	2	15	1	E1	A	161.644
2970.1880	72.9	14	2	15	1	G	A	161.644
2970.1583	76.9	12	5	11	5		B	154.238
2970.1439	340.2	4	2	5	3		A	43.926
2970.1226	173.9	9	0	10	1		A	75.572

WAVENUMBER (CM-1)	INT	JU	KU	JL	KL	SYM	BAND	E LOWER (CM-1)
2970.0319	38.9	9	2	8	2		B	58.408
2969.9944	55.5	12	6	11	6		B	183.610
2969.8846	14.4							
2969.7737	31.2							
2969.6259	29.7	17	3	18	2	G	A	237.127
2969.6179	9.9	17	3	18	2	E1	A	237.127
2969.5913	100.5	10	1	9	1		B	62.322
2969.5654	25.4							
2969.5041	160.8	12	1	13	0		A	120.583
2969.4629	211.9	7	1	8	2		A	58.408
2969.4215	20.7	13	1	12	1		B	106.038
2969.3372	14.9							
2969.3109	10.2							
2969.3047	8.4							
2969.2522	41.7	12	2	11	2		B	98.157
2969.2234	77.6	10	0	9	0	A2	B	59.651
2969.2121	47.6	10	0	9	0	E4	B	59.651
2969.1819	11.4							
2969.1458	10.4							
2969.0539	10.0	20	4	21	3	A1,2	A	329.785
2969.0339	5.5	20	4	21	3	E3,4	A	329.785
2968.8788	8.5							
2968.8632	77.4	15	2	16	1?		A	182.817
2968.8482	83.1	11	4	10	4		B	115.632
2968.8182	336.5	5	2	6	3		A	51.880
2968.7977	160.8	10	0	11	1		A	90.164
2968.7860	47.7	11	3	10	3	E3,4	B	96.938
2968.7742	96.8	11	3	10	3	A1,2	B	96.938
2968.7656	66.0	11	5	10	5		B	139.666
2968.7037	38.6	8	2	7	2		B	47.805
2968.6131	32.0							
2968.5988	58.4	11	6	10	6		B	169.039
2968.5711	16.9							
2968.5136	10.9							
2968.4311	20.9							
2968.3740	30.7							
2968.3373	11.3							
2968.2992	23.1	18	3	19	2	G	A	262.248
2968.2923	5.6	18	3	19	2	E1	A	261.248
2968.2860	22.5							
2968.2260	100.5	9	1	8	1		B	50.395
2968.2036	78.2							
2968.1813	75.9	3	3	4	4?	E1	A	55.992
2968.1733	249.5	3	3	4	4	G	A	55.992
2968.1622	13.1							
2968.1387	228.5	8	1	9	2		A	70.334
2968.0980	17.0							
2968.0689	26.5	12	1	11	1		B	90.146
2968.0196	17.9							
2967.9936	35.7							

WAVENUMBER (CM-1)	INT	JU	KU	JL	KL	SYM	BAND	E LOWER (CM-1)
2967.9528	9.0							
2967.9368	57.0	11	2	10	2		B	83.584
2967.8627	38.0							
2967.8393	48.9	9	0	8	0	A1	B	67.724
2967.8279	16.5	9	0	8	0	E3	B	67.724
2967.7943	9.7							
2967.7736	11.4							
2967.7583	38.0							
2967.7435	18.1							
2967.6675	37.6							
2967.6563	13.4							
2967.6125	10.6							
2967.6003	36.8							
2967.5539	42.5							
2967.5353	47.9							
2967.5205	32.3							
2967.4946	326.2	6	2	7	3		A	61.159
2967.4736	147.9	11	0	12	1		A	106.038
2967.4680	77.9							
2967.4556	19.8	10	3	9	3		B	83.688
2967.4212	27.5							
2967.4137	48.3	10	3	9	3	E3,4	B	83.688
2967.4026	100.8	10	3	9	3	A1,2	B	83.688
2967.3795	67.8	10	5	9	5		B	126.417
2967.2105	82.1	10	6	9	6?		B	155.789
2967.0154	14.6	6	5	6	6	E3,4	A	123.983
2966.9967	26.7	7	5	7	6		A	133.261
2966.9819	27.5							
2966.9764	35.0	8	5	8	6	E3,4	A	143.863
2966.9514	35.0	9	5	9	6	E3,4	A	155.789
2966.9343	38.7	10	5	10	6		A	169.039
2966.9204	32.2	6	5	6	6	A1,2	A	123.983
2966.9034	50.6							
2966.8934	34.0							
2966.8809	116.7	8	5	8	6	A1,2	A	143.863
2966.8665	116.6							
2966.8596	103.0							
2966.8501	70.2	9	5	9	6	A1,2	A	155.789
2966.8368	236.9	4	3	5	4		A	62.621
2966.8134	193.5	9	1	10	2		A	83.584
2966.7688	24.8							
2966.7471	55.3	11	5	11	6		A	183.610
2966.7177	30.2	11	1	10	1		B	75.572
2966.7014	34.0							
2966.6626	48.5	12	5	12	6		A	199.504
2966.6234	62.1							
2966.5470	34.8	13	5	13	6		A	216.718
2966.5257	12.2							
2966.4638	84.1	8	0	7	0	A2	B	37.121
2966.4513	49.4	8	0	7	0	E4	B	37.121

WAVENUMBER (CM-1)	INT	JU	KU	JL	KL	SYM	BAND	E LOWER (CM-1)
2966.3927	23.8	14	5	14	6		A	235.252
2966.2068	36.8							
2966.1969	18.6							
2966.1710	299.3	7	2	8	3		A	71.762
2964.1499	122.3	12	0	13	1		A	123.254
2966.1417	10.4							
2966.0930	94.8	9	4	8	4		B	90.456
2966.0473	80.5							
2966.0361	107.0	9	3	8	3		B	71.762
2966.0010	63.3	9	5	8	5		B	114.490
2965.9598	11.9							
2965.8255	50.1	9	6	8	6		B	143.863
2965.8004	72.9							
2965.6451	14.9	20	3	21	2		A	316.433
2965.6115	8.5							
2965.5948	28.3							
2965.5565	63.5							
2965.5398	56.1							
2965.5102	100.5	7	1	6	1?		B	30.513
2965.4895	361.3	5	3	6	4		A	70.575
2965.3876	19.3							
2965.3688	31.5	10	1	9	1		B	62.322
2965.3125	75.2	9	2	8	2		B	58.408
2965.2544	8.4							
2965.0939	52.3	7	0	6	0	A1	B	27.842
2965.0822	17.3	7	0	6	0	E3	B	27.842
2964.9735	8.7							
2964.8805	37.2	18	2	19	1		A	254.237
2964.8479	277.2	8	2	9	3		A	83.688
2964.8261	105.0	13	0	14	1		A	141.789
2964.7221	97.3	8	4	7	4		B	79.853
2964.7085	9.2							
2964.6850	57.9	8	3	7	3	E3,4	B	61.159
2964.6745	102.6	8	3	7	3	A1,2	B	61.159
2964.6471	26.4	8	3	7	3		B	61.159
2964.6268	49.4	8	5	7	5		B	103.888
2964.6129	10.0							
2964.4489	40.1	8	6	7	6		B	133.261
1964.3923	112.5							
2964.3456	13.4							
2964.3305	16.3							
2964.3145	21.8							
2964.3040	23.1							
2964.2966	57.5							
2964.2595	194.0	6	3	7	4		A	79.853
2964.2443	76.6							
2964.2329	59.2							
2964.2184	87.0							
2964.1645	165.7	11	1	12	2		A	114.051
2964.1570	92.1	6	1	5	1		B	22.559

TABLE 2. *continued*

WAVENUMBER (CM-1)	INT	JU	KU	JL	KL	SYM	BAND	E LOWER (CM-1)
2964.1295	25.3							
2964.1144	123.5							
2964.0760	21.3							
2964.0221	33.2	9	1	8	1		B	50.395
2964.0039	68.7	8	2	7	2		B	47.805
2963.9081	8.5							
2963.7306	75.6	6	0	5	0	A2	B	19.888
2963.7187	49.6	6	0	5	0	E4	B	19.888
2963.6447	255.5	4	4	5	5		A	86.656
2963.6219	24.3							
2963.5492	22.8	19	2	20	1		A	280.673
2963.5255	244.1	9	2	10	3		A	96.938
2963.5029	88.6	14	0	15	1		A	161.644
2963.3916	22.0	4	2	3	2		B	18.640
2963.3566	74.0	7	4	6	4		B	70.575
2963.3251	50.8	7	3	6	3	E3,4	B	51.880
2963.3140	92.3	7	3	6	3	A1,2	B	51.880
2963.2628	20.9	7	3	6	3		B	51.880
2963.2547	45.4	7	5	6	5		B	94.610
2963.0783	24.6	7	6	6	6		B	123.983
2963.0089	155.4	7	3	8	4		A	90.456
2962.9737	8.7							
2962.9113	54.5							
2962.8989	37.9							
2962.8432	151.6	12	1	13	2		A	131.266
2962.8082	83.2	5	1	4	1		B	15.930
2962.7786	23.3							
2962.7643	21.6							
2962.6975	119.8	7	2	6	2?		B	38.526
2962.6788	36.0	8	1	7	1		B	39.792
2962.5642	11.4							
2962.3728	41.0	5	0	4	0	A1	B	13.259
2962.3611	13.9	5	0	4	0	E3	B	13.259
2962.3236	290.1	5	4	6	5		A	94.610
2962.2123	15.6							
2962.2036	219.4	10	2	11	3		A	111.510
2942.1801	71.2	15	0	16	1		A	182.817
2962.0640	10.8	3	2	2	2		B	14.662
2941.9950	50.1	6	4	5	4		B	62.621
2961.9700	40.9	6	3	5	3	E3,4	B	43.926
2961.9590	81.1	6	3	5	3	A1,2	B	43.926
2961.8923	29.0	6	5	5	5		B	86.656
2961.8812	17.3	6	3	5	3		B	43.926
2961.6527	170.2	8	3	9	4		A	102.383
2941.5894	51.9							
2961.5794	60.0							
2961.5209	131.4	13	1	14	2		A	149.801
2961.4631	75.9	4	1	3	1		B	10.627
2961.4550	26.8							
2961.4340	21.3							
2961.4143	12.9							
2961.3912	73.5	6	2	5	2		B	30.572
2961.3787	13.2							
2961.3568	10.0							
2961.3355	37.9	7	1	6	1		B	30.513
2961.3160	10.2							
2961.2946	9.2							
2961.2314	27.5							
2961.2216	11.8							
2961.1913	16.8							
2961.1827	19.4							
2961.1765	12.4							
2961.1697	22.3							
2961.1561	48.1							
2961.1448	37.0							
2961.1335	45.2							
2961.1167	11.2							
2961.1041	9.2							
2961.0497	13.2							
2961.0275	18.1							
7961.0205	60.3	4	0	3	0		B	7.956
2961.0047	268.0	6	4	7	5		A	103.888
2960.9641	27.8							
2960.8825	183.4	11	2	12	3		A	127.404
2960.8590	62.3	16	0	17	1		A	205.308
2960.6402	33.5	5	4	4	4		B	55.992
2960.6189	31.5	5	3	4	3	E3,4	B	37.297
2960.6076	63.7	5	3	4	3	A1,2	B	37.297
2960.5013	10.4	5	3	4	3		B	37.297
2960.3181	161.3	9	3	10	4		A	115.632
2960.2689	44.6							
2960.2613	22.1							
2960.1999	108.7	14	1	15	2		A	169.656
2960.1463	16.8							
2960.1216	50.1	3	1	2	1		B	6.649
2960.0878	71.0	5	2	4	2		B	23.943
2959.9962	34.4	6	1	5	1		B	22.559
2959.9820	10.4							
2959.7275	12.1							
2959.6843	235.3	7	4	8	5		A	114.490
2959.6749	27.0	3	0	2	0	A1	B	3.978
2959.6635	14.4	3	0	2	0	E3	B	3.978
2959.5628	155.8	12	2	13	3		A	144.619
2959.5379	72.2	17	0	18	1		A	229.115
2959.4433	10.2							
2959.2726	18.4	4	3	3	3	E3,4	B	31.994
2959.2613	39.6	4	3	3	3	A1,2	B	31.994
2959.1241	3.9	4	3	3	3		B	31.994
2959.0828	85.8	5	5	6	6	E3,4	A	123.983
2958.9846	148.2	10	3	11	4		A	130.204
2958.9778	186.8	5	5	6	6	A1,2	A	123.983
2958.9487	38.1							
2958.9432	33.5							
2958.8786	86.1	15	1	16	2		A	190.829
2958.8373	15.4							
2958.7857	69.5	2	1	1	1?		B	3.997
2958.6885	11.3							
2958.6579	31.3	5	1	4	1		B	15.930
2958.5627	11.6							
2958.5430	9.5							
2958.5349	11.1							
2958.3676	207.1	8	4	9	5		A	126.417
2958.3345	37.3	2	0	1	0	A2	B	1.326
2958.3217	19.3	2	0	1	0	E4	B	1.326
2958.2416	119.6	13	2	14	3		A	163.155
2958.2164	36.8	18	0	19	1	G	A	254.237
2958.2101	9.2	18	0	19	1?	E1	A	254.237
2958.1989	10.7							
2958.1832	13.7							
2958.1745	15.1							
2958.1595	16.1							
2958.1520	8.7							
2958.1366	22.0							
2958.1156	17.8							
2958.0963	54.3							
2958.0863	53.8							
2958.0794	18.3	11	8	11	9		A	303.742
2958.0719	8.5	10	8	10	9	E3,4	A	289.171
2958.0632	14.9	10	8	10	9	A1,2	A	289.171
2958.0531	11.3							
2958.0481	10.2	9	8	9	9		A	275.923
2957.7361	81.1	6	5	7	6	E3,4	A	133.261
2957.6579	135.9	11	3	12	4		A	146.098
2957.6402	166.0	6	5	7	6	A1,2	A	133.261
2957.6282	43.2							
2957.5572	66.8	16	1	17	2		A	213.320
2957.5291	11.8							
2957.4879	38.6	3	2	2	2		B	14.662
2957.3215	27.8	4	1	3	1		B	10.627
2957.2065	8.4							
2957.0708	12.9							
2957.0514	167.7	9	4	10	5		A	139.666
2956.9983	11.1	1	0	0	0?		B	
2956.9226	87.0	14	2	15	3		A	183.009
2956.8950	27.5	19	0	20	1		A	280.673
2956.8757	8.7							
2956.6412	31.0							
2956.5802	8.4							
2956.3912	79.5	7	5	8	6	E3,4	A	143.863
2956.3346	111.4	12	3	13	4		A	163.313
2956.3103	43.4							
2956.2992	146.6	7	5	8	6	A1,2	A	143.863
2956.2363	48.5	17	1	18	2		A	237.127
2956.2022	9.5	6	1	6	1		B	30.513
2956.1769	8.5	5	1	5	1		B	22.559
2956.1584	12.7	4	1	4	1		B	15.930
2956.1435	12.7	3	1	3	1		B	10.627
2956.1318	19.7	2	1	2	1		B	6.649
2956.1238	32.2	1	1	1	1		B	3.997
2956.0935	8.5							
2955.9869	29.7	3	1	2	1		B	6.649
2955.7368	144.4	10	4	11	5		A	154.238
2955.7111	9.7							
2955.6044	57.6	15	2	16	3	A1,2	A	204.182
2955.5926	38.6	15	2	16	3?	E3,4	A	204.182
2955.5741	18.6	20	0	21	1		A	308.421
2955.5342	8.7							
2955.4586	12.9							
2955.3146	9.0							
2955.2217	10.2							
2955.1766	32.8							
2955.1473	8.5							
2955.1273	9.4							
2955.0461	69.2	8	5	9	6	E3,4	A	155.789
2955.0091	93.7	13	3	14	4		A	181.848
2954.9979	147.1	6	6	7	7		A	167.971
2954.9679	39.5							
2954.9516	127.3	8	5	9	6	A1,2	A	155.789
2954.9235	9.0							
2954.9166	35.3							
2954.7911	8.5							
2954.7334	8.5							
2954.6552	13.4	2	1	1	1?		B	3.997
2954.5808	10.9							
2954.5428	12.2							
2954.4211	119.8	11	4	12	5		A	170.132
2954.4050	15.2							
2954.3963	9.5							
2954.3414	28.2	0	0	1	0?		B	1.326
2954.3291	27.0							
2954.2967	28.2	16	2	17	3	E3,4	A	226.672
2954.2890	42.4	16	2	17	3	A1,2	A	226.672
2954.2672	25.1							
2954.2531	33.5							
2954.2287	13.4							
2954.2125	24.9	10	4	10	4		B	115.632
2954.1944	19.1							
2954.1864	28.5	11	5	11	5		B	154.238
2954.1679	25.0							
2954.1617	45.4	9	4	9	4		B	102.383
2954.1474	14.4							
2954.1343	10.9							
2954.1255	36.0	10	5	10	5		B	139.666
2954.1168	55.8	8	4	8	4		B	90.456
2954.1055	30.0							
2954.0910	27.8							
2954.0764	65.5	7	4	7	4		B	79.853
2954.0695	54.8	9	5	9	5		B	126.417
2954.0405	93.1	6	4	6	4		B	70.575
2954.0330	34.7							
2954.0205	81.1	8	5	8	5		B	114.490
2954.0111	103.6	5	4	5	4		B	62.621
2954.0036	43.7	5	3	5	3		B	43.926
2953.9875	142.2	4	4	4	4		B	55.992
2953.9752	96.6	4	3	4	3		B	37.297
2953.9684	40.1							
2953.9560	124.6	3	3	3	3?	E3,4	B	31.994
2953.9386	175.1	3	3	3	3?	A1,2	B	31.994
2953.9254	16.4							
2953.9042	137.4	5	5	5	5		B	86.656
2953.8960	64.0	9	6	9	6		B	155.789
2953.8827	10.4							
2953.8713	39.6							
2953.8430	80.9	8	6	8	6		B	143.863
2953.8196	15.4							
2953.7973	132.5	7	6	7	6		B	133.261
2953.7813	11.6							
2953.7714	12.4							
2953.7572	137.0	6	6	6	6		B	123.983
2953.7410	39.2							
2953.7285	41.2							
2953.7066	32.3							
2953.6965	55.8	9	5	10	6	E3,4	A	169.039
2953.6870	15.6							
2953.6750	24.0							
2953.6667	182.2	7	6	8	7		A	178.573
2953.6497	40.5							
2953.6398	32.3							
2953.6108	71.9							
2953.5966	132.7	9	5	10	6	A1,2	A	169.039
2953.5620	97.5							
2953.5509	9.5							
2953.5396	63.3	2	2	2	2		B	14.662
2953.5215	31.0							
2953.5096	31.1	3	2	3	2		B	18.640
2953.4822	17.6	4	2	4	2		B	23.943
2953.4719	34.5	1	1	2	1		B	6.649
2953.4578	10.4	5	2	5	2		B	30.572
2953.4478	39.2							
2953.4155	10.7							
2953.3835	56.1							
2953.3749	19.4							
2953.3445	8.7							
2953.3257	69.3							
2953.2964	9.7							
2953.2820	23.5							
2953.2051	10.6							
2953.1970	39.9							
2953.1204	42.8							
2953.1081	103.6	12	4	13	5		A	187.346
2953.0506	53.1							
2953.0293	10.6							
2953.0193	17.3	1	0	2	0?	A1	B	3.978
2953.0037	12.9	1	0	2	0?	E3	B	3.978
2952.9685	29.0							
2952.9598	18.4	17	2	18	3	A1,2	A	250.479
2952.9401	11.1	17	2	18	3	E3,4	A	250.479
2952.9067	15.1							
2952.8174	23.9							
2952.7820	17.0	3	2	4	2		B	23.943
2952.7375	27.5							
2952.6973	14.1							
2952.6892	11.3							
2952.6097	14.1							
2952.5693	12.2							
2952.4522	10.8							
2952.3824	61.8	15	3	16	4?		A	222.875
2952.3546	47.1	10	5	11	6	E3,4	A	183.610
2952.3379	115.6	8	6	9	7		A	190.499
2952.3144	28.8							
2952.2752	21.3							
2952.2339	35.4							
2952.2277	86.8	10	5	11	6	A1,2	A	183.610
2952.1539	48.4	2	1	3	1		B	10.627
2952.1245	13.4							
2952.0157	11.4							
2952.0088	11.2							
2951.9994	14.6	1	1	1	1		B	3.997
2951.8954	11.7							
2951.7944	81.1	13	4	14	5		A	205.881
2951.7036	44.9	2	0	3	0	A2	B	7.956
2951.6908	27.0	2	0	3	0	E4	B	7.956
2951.6575	35.7	18	2	19	3		A	275.601
2951.5485	15.9							
2951.5198	9.7							
2951.4579	23.9	4	2	5	2		B	30.572
2951.2453	13.1							
2951.2003	10.2							
2951.1089	11.7							
2951.0932	10.2							
2951.0596	46.9	16	3	17	4	G	A	245.365
2951.0440	13.4	16	3	17	4	E1	A	245.365
2951.0082	99.7	9	6	10	7		A	203.748
2950.9897	61.3							
2950.9495	15.1							
2950.8420	78.1	11	5	12	6?		A	199.504
2950.8093	17.6							
2950.7667	38.6							
2950.4799	69.0	14	4	15	5		A	225.735
2950.4605	26.7							
2950.4467	105.0	7	7	8	8		A	218.619
2950.3931	31.8	3	0	4	0	A1	B	13.259
2950.3803	14.7	3	0	4	0	E3	B	13.259
2950.3442	13.4	19	2	20	3	E3,4	A	302.036
2950.3373	24.9	19	2	20	3	A1,2	A	302.036
2950.2354	9.5							
2950.2260	8.5							
2950.1855	17.4							
2950.1349	24.0	5	2	6	2		B	38.526
2950.1052	8.7							
2950.0865	12.7							
2949.9342	12.2							
2949.7764	10.4							
2949.7495	36.5	17	3	18	4		A	269.172
2949.7297	22.3							
2949.6822	87.3	10	6	11	7		A	218.319
2949.6655	20.4							
2949.6144	45.4							
2949.6050	10.2							
2949.5871	9.4							
2949.5611	33.3	2	2	3	2?		B	18.640
2949.5299	76.4	4	1	5	1		B	22.559
2949.5000	22.6							
2949.4349	51.8	12	5	13	6		A	216.718
2949.4199	13.4							
2949.3469	13.9	1	1	2	1		B	6.649
2949.3115	37.6							
2949.2542	8.4							
2949.1685	55.3	15	4	16	5	G	A	246.908
2949.1604	14.6	15	4	16	5?	E1	A	246.908
2949.1441	24.3							
2949.1222	90.6	8	7	9	8?		A	230.544
2949.0875	61.0	4	0	5	0	A2	B	19.888
2949.0753	37.5	4	0	5	0	E4	B	19.888
2949.0303	21.8							
2949.0209	22.8							
2948.8108	27.0	6	2	7	2		B	47.805
2948.6667	15.5							
2948.6477	18.6	3	3	4	3	E3,4	B	37.297
2948.6353	35.0	3	3	4	3	A1,2	B	37.297
2948.5519	9.7							
2948.4671	11.1	3	3	4	3		B	37.297
2948.4327	31.6	18	3	19	4	G	A	294.293
2948.4154	8.2	18	3	19	4	E1	A	294.293
2948.3568	75.2	11	6	12	7		A	234.212
2948.3481	16.0							
2948.3425	18.6							
2948.3093	21.5							
2948.2462	14.2							
2948.2221	83.3	5	1	6	1		B	30.513
2948.2061	65.1	3	2	4	2		B	23.943
2948.1943	22.3							
2948.1255	13.9							
2948.0675	8.7							
2948.0568	18.4							
2948.0443	13.6							
2948.0245	22.3	2	1	3	1		B	10.627
2947.9960	33.7	13	5	14	6		A	235.252
2947.8839	33.9							
2947.8776	25.0							
2947.8466	12.6							
2947.8284	20.3							
2947.8216	18.1							
2947.7879	40.5	5	0	6	0		B	27.842
2947.7744	76.3	9	7	10	8?		A	243.793
2947.7206	6.9	21	2	22	3	E3,4	A	358.844
2947.7089	13.9	21	2	22	3	A1,2	A	358.844
2947.6502	11.8							
2947.5588	19.1							
2947.4881	27.3	7	2	8	2		B	58.408
2947.3569	32.5							
2947.3394	28.7	4	3	5	3	E3,4	B	43.926
2947.3276	58.1	4	3	5	3	A1,2	B	43.926
2947.1907	22.5	4	3	5	3		B	43.926
2947.1580	12.4							
2947.1199	24.5	19	3	20	4		A	320.728
2947.0974	12.4							
2947.0324	62.7	12	6	13	7		A	251.426
2947.0199	28.2							
2946.9214	81.4	6	1	7	1		B	39.792
2946.9042	14.1							
2946.8923	21.8							
2946.8686	17.8							
2946.8536	45.7	4	2	5	2		B	30.572
2946.7942	28.1							
2946.7053	28.7	3	1	4	1		B	15.930
2946.6603	13.4							
2946.5777	55.5							
2946.5453	30.7	17	4	18	5	G	A	293.203
2946.5324	7.1	17	4	18	5	E1	A	293.203
2946.5175	26.8	14	5	15	6		A	255.106
2946.4940	71.6	6	0	7	0	A2	B	37.121
2946.4821	40.4	6	0	7	0	E4	B	37.121
2946.4709	33.4							
2946.4083	8.7							
2946.2970	16.6							
2946.2664	11.7							
2946.1651	26.5	8	2	9	2		B	70.334
2946.1174	39.0	8	8	9	9	E3,4	A	275.923
2946.1074	67.2	8	8	9	9	A1,2	A	275.923
2946.0936	19.1							
2946.0699	19.1							
2946.0567	54.8	5	4	6	4		B	70.575
2946.0346	41.2	5	3	6	3	E3,4	B	51.880
2946.0227	77.2	5	3	6	3	A1,2	B	51.880
2945.9899	10.8							
2945.9504	26.4	5	5	6	5		B	94.610
2945.9167	33.4	5	3	6	3		B	51.880
2945.8065	16.5							
2945.7090	49.3	13	6	14	7		A	269.961
2945.6628	12.6							
2945.6225	86.4	7	1	8	1		B	50.395
2945.5953	24.1							
2945.5613	13.6							
2945.5502	16.3							
2945.5156	16.5							
2945.5033	50.4	5	2	6	2		B	38.526
2945.4214	28.3							
2945.3976	10.6							
2945.3884	33.0	4	1	5	1		B	22.559
2945.3291	10.6							
2945.2735	24.1							
2945.2299	37.6							
2945.2061	47.7	7	0	8	0	A1	B	47.724
2945.1951	15.0	7	0	8	0	E3	B	47.724
2945.0812	31.3							
2945.0215	11.1							
2944.9999	13.4							
2944.9553	15.4							
2944.8449	29.6	9	2	10	2		B	83.584
2944.8053	31.5	9	8	10	9	E3,4	A	289.171
2944.7961	57.4	9	8	10	9	A1,2	A	289.171
2944.7831	8.7							
2944.7609	58.3							
2944.7351	42.7	6	3	7	3	E3,4	B	61.159
2944.7235	81.1	6	3	7	3	A1,2	B	61.159
2944.7125	10.2							
2944.6847	8.7							
2944.6578	48.8	6	5	7	5		B	103.888
2944.6448	43.2	6	3	7	3		B	61.159
2944.6299	24.6							
2944.5142	22.3							
2944.4946	11.6							
2944.4777	23.6	6	6	7	6		B	133.261
2944.3873	10.9							
2944.3721	32.7	14	6	15	7		A	289.814
2944.3291	83.3	8	1	9	1		B	62.322
2944.3020	22.3							
2944.2186	14.4							
2944.1793	15.8							
2944.1549	48.6	6	2	7	2		B	47.805
2944.0728	37.0	5	1	6	1		B	30.513
2944.0228	50.9							
2943.9761	33.0							
2943.9652	11.1							
2943.9566	16.5							
2943.9265	69.3	8	0	9	0	A2	B	59.651
2943.9147	40.1	8	0	9	0	E4	B	59.651
2943.9098	49.1							
2943.8925	16.6							
2943.8505	11.2							
2943.8153	13.9							
2943.8073	15.2							
2943.7121	23.5							
2943.5241	24.1	10	2	11	2		B	98.157
2943.4954	25.0	10	8	11	9	E3,4	A	303.742
2943.4867	46.2	10	8	11	9	A1,2	A	303.742
2943.4713	71.9	7	4	8	4		B	90.456
2943.4509	15.4							
2943.4385	58.4	7	3	8	3	E3,4	B	71.762
2943.4274	85.7	7	3	8	3	A1,2	B	71.762
2943.4039	11.8							
2943.3752	43.7	7	3	8	3		B	71.762
2943.3691	54.6	7	5	8	5		B	114.490
2943.1927	35.3	7	6	8	6		B	143.863
2943.1838	11.8							
2943.1724	21.3							
2943.1020	31.1							
2943.0726	9.7							
2943.0388	78.4	9	1	10	1		B	75.572
2943.0128	20.6							
2942.9582	12.9							
2942.8779	12.7							
2942.8095	46.6	7	2	8	2		B	58.408
2942.7593	39.0	6	1	7	1		B	39.792
2942.7088	16.5							
2942.6525	40.1	9	0	10	0	A1	B	72.901
2942.6405	17.3	9	0	10	0	E3	B	72.901
2942.6055	16.6							
2942.5961	40.2							
2942.5822	10.6							
2942.5467	18.9							
2942.5361	24.8							
2942.5230	13.4							
2942.5167	21.3							
2942.4323	9.9							
2942.3579	16.6							
2942.2789	14.1							
2942.2010	21.8	11	8	12	9	E3,4	A	319.634
2942.1865	92.7	8	4	9	4		B	102.383
2942.1790	40.7	11	8	12	9	A1,2	A	319.634
2942.1715	10.2							
2942.1478	47.2	8	3	9	3	E3,4	B	83.688
2942.1365	84.8	8	3	9	3	A1,2	B	83.688
2942.1096	43.6	8	3	9	3		B	83.688
2942.0914	46.4	8	5	9	5		B	126.417
2942.0781	10.9							
2941.9325	20.4							
2941.9147	43.8	8	6	9	6		B	155.789
2941.8178	39.4							
2941.7957	9.2							
2941.7782	26.3							
2941.7538	74.2	10	1	11	1		B	90.144
2941.7288	18.6							
2941.7238	22.8							
2941.6819	20.7							
2941.5386	16.3							
2941.4880	8.4							
2941.4668	39.9	8	2	9	2		B	70.334
2941.4499	40.7	7	1	8	1		B	50.395
2941.3967	8.9							
2941.3867	58.6	10	0	11	0	A2	B	87.473
2941.3748	38.7	10	0	11	0	E4	B	87.473
2941.3630	12.7							
2941.3348	9.7							
2941.2846	31.0							
2941.2739	13.4							
2941.2523	17.1							
2941.2365	8.4							
2941.1047	23.3							
2941.0972	18.4							
2941.0852	44.2							
2941.0153	13.4							
2940.9588	9.9							
2940.9252	8.4							
2940.9064	88.8	9	4	10	4		B	115.632
2940.8876	8.5							
2940.8736	41.4							
2940.8673	17.6							
2940.8610	41.7	9	3	10	3	E3,4	B	96.938
2940.8496	87.3	9	3	10	3	A1,2	B	96.938
2940.8151	53.4	9	5	10	5		B	139.666
2940.7951	11.3							
2940.6419	49.8	9	6	10	6		B	169.039
2940.6319	13.1							
2940.5119	30.2							
2940.4880	8.7							
2940.4728	64.3	11	1	12	1		B	106.038
2940.4646	18.4							
2940.4570	22.8							
2940.4475	20.8							
2940.4124	24.0							
2940.2855	22.3							
2940.2005	10.7							
2940.1411	36.5	8	1	9	1		B	62.322
2940.1279	53.6	11	0	12	0	A1	B	103.367
2940.1178	10.4	11	0	12	0?	E3	B	103.367
2940.0562	11.2							
2939.9753	23.1							
2939.9327	9.0							
2939.8081	18.3							
2939.6831	34.2							
2939.6520	19.4							
2939.6389	20.3							
2939.6321	62.6	10	4	11	4		B	130.204
2939.6198	18.3	10	3	11	3		B	111.510
2939.5851	45.6							
2939.5775	40.1	10	3	11	3	E3,4	B	111.510
2939.5675	97.1	10	3	11	3	A1,2	B	111.510
2939.5457	61.3	10	5	11	5		B	154.238
2939.3764	48.0	10	6	11	6		B	183.610
2939.2680	20.1							
2939.2067	24.9							
2939.1955	57.1	12	1	13	1		B	123.254
2939.1708	14.1							
2939.1504	31.7							
2938.8797	46.4	12	0	13	0		B	120.583
2938.8690	33.7							
2938.8609	28.6							
2938.8351	35.0	9	1	10	1		B	75.572
2938.7866	31.5	10	2	11	2		B	98.157
2938.7520	20.1							
2938.7211	11.3							
2938.6664	18.1							
2938.5439	10.2							
2938.4754	9.5							
2938.3932	10.4							
2938.3796	31.6							
2938.3641	55.0	11	4	12	4		B	146.098
2938.3252	41.2							

TABLE 2. *continued*

WAVENUMBER (CM-1)	INT	TRANSITION				SYM	BAND	E LOWER (CM-1)
		JU	KU	JL	KL			
2938.3005	33.0	11	3	12	3	E3,4	B	127 404
2938.2893	67 7	11	3	12	3	A1,2	B	127 404
2938.2825	58.3							
2938.2762	29.2							
2938.2668	19.7							
2938.2274	10.4							
2938.2043	28.3	14	2	15	2		B	169.656
2938.1174	45.6	11	6	12	6		B	199.504
2938.0142	8.7							
2937 9232	49.6	13	1	14	1		B	141 789
2937 9046	20.7							
2937.8947	33.0							
2937.8647	19.1							
2937.8478	12.6							
2937.8022	13.4							
2937.7874	9.4							
2937 6495	9.9							
2937.6402	29.0	13	0	14	0	A1	B	139.118
2937 4283	11.3	13	0	14	0	E3	B	139.118
2937.6196	17.8							
2937 5586	14.6							
2937 5328	40.1	10	1	11	1		B	90.144
2937.4507	60.6	11	2	12	2?		B	114.051
2937.4173	10.7							
2937.3524	13.1							
2937.2962	14.6							
2937.1862	8.4							
2937.1114	15.9							
2937 1012	47.1	12	4	13	4		B	163.313
2937.0670	34.2							
2937 0255	68.8							
2937.0148	60.0							
2936.9667	28.0							
2936.9573	8.5							
2936.8634	42.0	12	6	13	6		B	216.718
2936.8330	11.1	15	2	16	2?		B	190.829
2936.8114	14.2							
2936.7897	18.6							
2936.6700	9.2							
2936.6522	39.5	14	1	15	1		B	161.644
2936.6453	24.0							
2936.6317	16.3							
2936.4014	14.2							
2936.5746	8.9							
2936.5152	9.7							
2936.4654	25.1							
2936.4353	9.2							
2936.4248	10.2							
2936.4105	37.2	14	0	15	0	A2	B	158.973
2936.4000	22.1	14	0	15	0	E4	B	158.973
2936.3757	22.1							
2936.2672	11.1							
2936.2308	27.7	11	1	12	1		B	106.038
2936.2024	9.7							
2936.1592	9.7							
2936.1511	17.9							
2936.1187	22.3	12	2	13	2		B	131 266
2936.0557	30.8							
2936.0159	9.2							
2936.0103	8.5							
2935.9998	8.5							
2935.8594	9.5							
2935.8518	17 3							
2935.8436	39.1	13	4	14	4		B	181 848
2935.8102	27 5							
2935.7750	39.5	13	5	14	5		B	205.881
2935.7571	24.4	13	3	14	3	E3,4	B	163.155
2935.7460	51 1	13	3	14	3	A1,2	B	163.155
2935.7210	8.4							
2935.6835	10.0							
2935.4685	11.4							
2935.6560	9.5							
2935.4169	38.4	13	6	14	6		B	235.252
2935.4026	28.2							
2935.3896	29.1							
2935 3816	26.5	15	1	16	1?		B	182.817
2935 3655	16.1							
2935 3526	10.8							
2935.2964	13.4							
2935.1920	16.5	15	0	16	0		B	180.147
2935.1382	14.4							
2935.0788	18.4							
2935.0351	12.6							
2934.9696	9.7							
2934.9449	8.4							
2934.9337	27.0	12	1	13	1		B	123.254
2934.8536	9.2							
2934.8270	10.4							
2934.8171	10.4							
2934.7948	10.2							
2934.7899	14.6							
2934.7689	11.4							
2934.6231	9.2							
2934.5997	9.2							
2934.5923	33.5	14	4	15	4		B	201 703
2934.5560	25.9							
2934.5491	9.7							
2934.5305	30.5	14	5	15	5		B	225.735
2934.4922	21.3	14	3	15	3	E3,4	B	183.009
2934.4803	41.5	14	3	15	3	A1,2	B	183.009
2934.4616	11.8							
2934.3792	32.2	14	6	15	6		B	255.106
2934.3495	14.6							
2934.1680	22.0							
2934.1246	34.2	16	1	17	1		B	205.308
2934.1039	9.7							
2934.0585	9.9							
2934.0257	11.4							
2934.0107	10.2							
2934.0026	13.9							
2933.9858	22.8							
2933.9759	21.1							
2933.9107	11.7							
2933.8339	9.2							
2933.7293	9.2							
2933.7074	17.6							
2933.6722	11.1							
2933.6387	21.5	13	1	14	1		B	141 789
2933.6121	10.8							
2933.6054	12.4							
2933.5749	8.7							
2933.5586	15.4							
2933.5474	11.2							
2933.4911	16.5							
2933.3997	17.3							
2933.3906	13.7							
2933.3781	14.6							
2933.3707	13.6							
2933.3540	9.9							
2933 3460	31.2	15	4	16	4		B	222.875
2933.3191	29.7							
2933.3016	24.1							
2933.2928	26.4							
2933.2549	10.2							
2933.2403	20.9							
2933.2311	19.4	15	3	16	3	E3,4	B	204.182
2933.2187	39.9	15	3	16	3	A1,2	B	204.182
2933.1465	32.0	15	6	16	6		B	276.278
2933.1165	17.1							
2933.0546	9.7							
2933.0344	14.7							
2932.9952	19.6							
2932.9791	27.8							
2932.9519	10.0							
2932.9383	27.3							
2932.9284	25.8							
2932.9062	13.4							
2932.8982	21.3							
2932.8888	23.8							
2932.8793	28.6							
2932.8641	26.5							
2932.8439	15.2							
2932.8376	25.9							
2932.8234	11.2							
2932.8148	9.5							
2932.7907	17.6							
2932.7763	14.4							
2932.7663	11.4							
2932.7525	10.0							
2932.7042	18.9							
2932.6987	20.7							
2932.6888	11.2							
2932.6319	19.1							
2932.5659	22.0							
2932.5498	9.2							
2932.4426	39.9							
2932.4010	13.4							
2932.3473	15.0							
2932.3306	18.4							
2932.2898	10.4							
2932.2773	14.4							
2932.2623	17.1							
2932.2304	25.1							
2932.2135	24.1							
2932.1743	10.6							
2932.1453	15.6							
2932.1129	14.2							
2932.1056	21.2	16	4	17	4		B	245.365
2932.0615	30.6							
2932.0465	18.3							
2932.0171	25.8							
2931 9848	14.2							
2931.9750	15.4	16	3	17	3	E3,4	B	226.672
2931.9616	28.1	16	3	17	3	A1,2	B	226.672
2931.9211	20.9	16	6	17	6		B	298.768
2931.8764	20.6							
2931.8037	8.4							
2931.7695	18.6							
2931 7601	10.6							
2931.7109	9.9							
2931.6851	11.7							
2931.6726	20.9							
2931.6313	11.3							
2931.6157	16.0							
2931.6100	14.4							
2931.6007	15.9							
2931.5406	15.4							
2931.5332	8.5							
2931.5141	12.6							
2931.4764	14.1							
2931.4424	18.1							
2931.4343	11.1							
2931.4156	12.9							
2931.4030	12.2							
2931.3509	20.6							
2931 3294	27.3							
2931.3195	25.3							
2931.3127	27.7							
2931 2755	10.7							
2931.2661	10.6							
2931.2523	9.9							
2931.2342	25.0							
2931.1848	12.9							
2931 1604	22.5							
2931.1185	19.9							
2931 1016	17.0							
2931.0593	13.4							
2930.9965	9.0							
2930.9384	58.0							
2930.9009	13.6							
2930.8712	17.3	17	4	18	4		B	269.172
2930.8358	18.6							
2930.7889	31.2							
2930.7720	30.6							
2930.7333	14.2							
2930.7233	25.3							
2930.7089	25.9							
2930.7020	22.3							
2930.6692	10.0							
2930.6584	9.7							
2930.6502	12.2							
2930.6185	64.3							
2930.5744	9.2							
2930.5219	15.6							
2930.4925	11.9							
2930.4812	41.7							
2930.3603	66.7							
2930.3529	13.1							
2930.3087	19.6							
2930.2709	14.2							
2930.2633	9.7							
2930.2494	22.3							
2930.1617	55.1							
2930.1129	20.4							
2930.0854	24.9							
2930.0429	13.9							
2930.0254	43.9							
2929.9947	21.3							
2929.9799	16.3							
2929.9582	12.1							
2929.9502	18.1							
2929.9345	13.2							
2929.9289	22.1							
2929.8409	14.7							
2929.7668	9.7							
2929.7569	37.0							
2929.6826	25.3							
2929.6421	16.1	18	4	19	4		B	294.293
2929.6185	20.6							
2929.6130	15.5							
2929 5982	30.8							
2929.5895	9.7							
2929.5660	25.9							
2929.5251	34.7							
2929.5026	30.1							
2929.4869	11.8							
2929.4734	10.8							
2929.4590	19.6							
2929.4521	35.4							
2929.4394	10.7							
2929.3857	24.1							
2929.3801	15.1							
2929.3733	33.2							
2929.3579	10.2							
2929.3418	11.2							
2929.3208	47.5							
2929.3060	11.3							
2929.2931	11.3							
2929.2431	27.0							
2929.2016	33.0							
2929.1837	10.2							
2929.1280	13.9							
2929.0992	37.0							
2929.0753	14.1							
2929.0238	10.2							
2929.0096	30.7							
2928.9805	18.6							
2928.9373	47.4							
2928.8947	20.9							
2928.8829	26.1							
2928.8472	24.5							
2928.8280	20.4							
2928.8200	9.2							
2928.8033	8.7							
2928.7847	9.4							
2928.7749	13.1							
2928.7335	9.7							
2928.7180	12.7							
2928.6896	11.1							
2928.5939	30.0	21	1	20	1		C	280.673
2928.4185	19.9							
2928.3363	23.3							
2928.3000	15.1							
2928.2857	22.3							
2928.2544	22.3							
2928.2369	10.4							
2928.2289	11.1							
2928.2129	14.4							
2928.1486	8.9							
2928.1325	18.6							
2928.1231	10.2							
2928.1119	12.1							
2928.1031	10.8							
2928.0501	22.8							
2928.0294	11.9							
2927.9787	8.9							
2927.9405	23.8							
2927.8525	10.4							
2927.8286	26.3							
2927.7210	29.0							
2927.6347	10.0							
2927.6216	31.3							
2927.6135	35.2							
2927.5724	40.1							
2927.5415	9.2							
2927.5316	33.0							
2927.4833	9.2							
2927.4599	12.2							
2927.4504	31.1							
2927.4403	13.2							
2927.4248	9.7							
2927.3815	26.1							
2927 3296	53.4	20	2	19	2		C	262.248
2927 3214	32.9							
2927 2745	16.9							
2927 2395	10.0							
2927 2031	20.7							
2927 1821	9.7							
2927 1679	15.4							
2927.0969	21.6							
2927.0369	45.7	20	1	19	1		C	254.237
2926.9974	21.8							
2926.9708	10.9							
2924.9343	15.0							
2926.9168	8.5							
2926.9087	24.5							
2926.8282	28.5							
2926.7720	25.9							
2926.7578	22.8							
2926.6967	41.4							
2926.6405	18.9							
2926.5940	16.3							
2926.5541	10.7							
2926.4903	12.6							
2926.2465	17.6							
2926.2173	14.1							
2926.1803	9.2							
2926.1692	13.7							
2926.1401	9.2							
2925.9975	54.6	19	3	18	3	A1,2	C	250.479
2925.9592	13.2							
2925.8600	13.7							
2925.8531	27.7	19	3	18	3	E3,4	C	250.479
2925.8462	8.5							
2925.8159	12.9							
2925.7986	10.6							
2925.7930	12.9							
2925.7671	12.6							
2925.7535	11.7							
2925.7461	11.8							
2925.7362	16.8							
2925.7214	10.9							
2925.7109	8.7							
2925.6805	16.4							
2925.6749	11.1							
2925.6624	8.9							
2925.6355	46.9	19	2	18	2		C	237.127
2925.6189	22.3							
2925.5676	18.6							
2925.5239	16.6							
2925.5007	15.6							
2925.4879	10.2							
2925.4798	9.2							
2925.4367	9.0							
2925.4101	65.2	19	1	18	1		C	229.115
2925.2347	21.6	19	0	18	0		C	226.444
2925.2265	9.2							
2925.1339	8.4							
2925.1108	16.4							
2925.0166	12.2							
2925.0000	10.7							
2924.9864	34.0							
2924.9770	18.8							
2924.9257	9.9							
2924.8761	8.7							
2924.8508	26.3							
2924.8206	10.0							
2924.7800	13.4							
2924.7612	10.2							
2924.7368	22.0							
2924.7206	9.2							
2924.6551	12.3							
2924.6431	9.0							
2924.6306	23.1							
2924.5642	27.5							
2924.5336	29.3							
2924.4791	12.6							
2924.4449	23.9							
2924.4070	39.0	18	4	17	4		C	245.365
2924.3854	12.4							
2924.3660	22.1							
2924.2935	15.9							
2924.2847	9.0							
2924.2353	58.1	18	3	17	3	A1,2	C	226.672
2924.2273	11.8							
2924.1909	29.7	18	3	17	3	E3,4	C	226.672
2924.1121	10.2							
2924.0934	9.9							
2924.0571	21.3							
2924.0433	31.1							
2923.9784	8.4							
2923.9698	69.2	18	2	17	2		C	213.320
2923.8141	20.8							
2923.8024	18.4							
2923.7919	31.1							
2923.7542	74.2	18	1	17	1		C	205.308
2923.6240	48.3	18	0	17	0		C	202.637
2923.6003	13.9							
2923.5543	10.4							
2923.5424	14.9							
2923.5043	15.1							
2923.4549	27.7							
2923.4028	16.9							
2923.3567	21.1							
2923.3117	16.6							
2923.3042	9.2							
2923.2798	10.7							
2923.2679	27.2							
2923.2573	48.5							
2923.2466	13.2							
2923.2335	15.2							
2923.2229	9.2							
2923.1997	9.9							
2923.1034	20.9							
2922.9377	12.4							
2922.8222	15.0							
2922.7969	47.1	17	4	16	4		C	222.875
2922.7357	11.2							
2922.7289	29.6							
2922.7049	27.0							
2922.6676	9.7							
2922.5955	19.3							
2922.5813	10.8							
2922.5523	23.3							
2922.5400	72.0	17	3	16	3	A1,2	C	204.182
2922.5078	35.7	17	3	16	3	E3,4	C	204.182
2922.5004	14.6							
2922.4437	9.7							
2922.2923	10.9							
2922.2761	91.1	17	2	16	2	G	C	190.829
2922.2680	15.8							
2922.2536	19.3							
2922.2036	25.3							
2922.1542	20.8	17	2	16	2	E1	C	190.829
2922.1286	22.3							
2922.1054	11.8							
2922.0842	90.6	17	1	16	1		C	182.817
2922.0317	9.2							
2921.9823	34.4	17	0	16	0		C	180.147
2921.9722	21.8							
2921.8290	10.4							
2921.5658	13.1							
2921.5470	39.7							
2921.4826	27.5							
2921.4172	27.5							
2921.2432	9.5							
2921.1695	58.4	16	4	15	4		C	201.703
2921.1243	16.5							
2921.0943	16.6							
2921.0481	8.4							
2921.0244	36.5							
2920.9824	24.4							
2920.9675	21.8							
2920.9595	11.7							
2920.8354	85.9	16	3	15	3	A1,2	C	183.009
2920.8110	44.6	16	3	15	3	E3,4	C	183.009
2920.6928	22.8							
2920.6007	10.8							
2920.5821	101.7	16	2	15	2	G	C	169.656
2920.5027	12.1							
2920.4927	31.5	16	2	15	2	E1	C	169.656
2920.4645	26.7							
2920.4203	47.0	16	1	15	1	E1	C	161.644
2920.4092	122.6	16	1	15	1	G	C	161.644
2920.3221	79.2	16	0	15	0		C	158.973
2920.2648	10.6							
2920.2578	12.7							
2920.1838	25.3							
2920.1671	9.7							
2920.1060	26.3							
2920.0612	15.2							
2919.9757	8.9							
2919.9114	9.4							
2919.8923	76.4							
2919.8386	10.8							
2919.7514	17.6							
2919.7409	9.2							
2919.7293	21.3							
2919.7232	15.9							
2919.5272	69.0	15	4	14	4	G	C	181.848
2919.4988	25.8							
2919.4809	14.7							
2919.4661	18.1	15	4	14	4	E1	C	181.848
2919.4259	26.0							
2919.2740	10.8							
2919.2182	19.9							
2919.1281	103.9	15	3	14	3	A1,2	C	163.155
2919.1106	53.2	15	3	14	3	E3,4	C	163.155
2918.9568	19.3							
2918.8893	128.0	15	2	14	2	G	C	149.801
2918.8615	13.6	18	6	17	6	A1,2	C	298.768
2918.8450	7.9	18	6	17	6	E3,4	C	298.768
2918.8130	31.5	15	2	14	2	E1	C	149.801
2918.7644	40.2	15	1	14	1	E1	C	141.789
2918.7379	136.7	15	1	14	1	G	C	141.789
2918.8655	58.8	15	0	14	0		C	139.118
2918.6193	8.4							
2918.5995	44.9							
2918.5476	28.3							
2918.4928	16.6							
2918.4526	14.2							
2918.3333	10.7							
2918.3252	13.4							
2918.2927	21.2							
2918.2510	12.6							
2918.1789	11.4							
2918.1703	24.4							
2917.9856	24.9							
2917.9544	12.7							
2917.8438	86.2	14	4	13	4	G	C	163.313
2917.7985	24.0	14	4	13	4	E1	C	163.313
2917.7614	8.9							
2917.7497	22.0							
2917.7336	14.4							
2917.6980	31.2							
2917.6667	15.1							
2917.6454	17.4	17	6	16	6	A1,2	C	276.278
2917.6298	11.2	17	6	16	6	E3,4	C	276.278
2917.6123	25.6							
2917.5712	21.3							
2917.4784	8.7							
2917.4372	11.9							
2917 4217	122.4	14	3	13	3	A1,2	C	144.619
2917 4063	61.3	14	3	13	3	E3,4	C	144.619
2917 3587	12.9							
2917 3142	38.1							
2917 2707	17.6							
2917.2021	144.4	14	2	13	2	G	C	131 266
2917 1601	37.5	14	2	13	2	E1	C	131 266
2917.0826	41.4	14	1	13	1	E1	C	123.254
2917.0695	167.8	14	1	13	1	G	C	123.254
2917.0245	21.1							
2917.0095	106.0	14	0	13	0		C	120.583
2916.9251	22.5							
2916.8325	20.9							
2916.6561	8.7							
2916.5435	25.0							
2916.4898	22.3							
2916.4483	12.6							
2916.4098	22.8	16	6	15	6	A1,2	C	255.106
2916.3966	15.0	16	6	15	6	E3,4	C	255.106
2916.3823	11.9							
2916.3378	19.8							
2916.3094	9.9							
2916.2686	20.6							
2916.2383	25.8							
2916.2115	53.6							
2916.1965	8.7							
2916.1859	23.9							
2916.1496	94.7	13	4	12	4	G	C	146.098
2916.1340	26.0	13	4	12	4	E1	C	146.098
2916.0638	18.3							
2916.0549	62.5	12	6	11	5		D	154.238
2916.0486	20.9							
2916.0353	37.0							
2915.8195	19.8							
2915.7069	70.6	13	3	12	3	E3,4	C	127.404
2915.7013	126.2	13	3	12	3	A1,2	C	127 404
2915.4907	24.8							
2915.5237	163.0	13	2	12	2	G	C	114.051
2915.4710	41.0	13	2	12	2	E1	C	114.051
2915.4225	44.2	13	1	12	1	E1	C	106.038
2915.4102	177.0	13	1	12	1	G	C	106.038
2915.3608	71.5	13	0	12	0		C	103.367
2915.3484	23.6							
2915.2450	19.8							
2915.2131	9.2							
2915.1551	27.7	15	6	14	6	A1,2	C	235.252
2915.1446	14.6	15	6	14	6	E3,4	C	235.252
2915.1153	9.9							

TABLE 2. *continued*

WAVENUMBER (CM-1)	INT	TRANSITION JU	KU	JL	KL	SYM	BAND	E LOWER (CM-1)
2915.0741	17.8							
2915.0684	12.6							
2915.0279	17.3							
2915.0137	20.1							
2914.9865	20.7							
2914.9698	22.5							
2914.9636	12.3							
2914.9482	38.5							
2914.9221	10.2							
2914.8713	13.9							
2914.7647	28.8							
2914.4819	10.0							
2914.4650	21.3							
2914.4562	110.4	12	4	11	4	G	C	130.204
2914.4262	30.5	12	4	11	4	E1	C	130.204
2914.3435	68.5	11	6	10	5	G	D	139.666
2914.3257	16.6	11	6	10	5	E1	D	139.666
2914.0162	156.3	12	3	11	3	A1,2	C	111.510
2914.0106	78.9	12	3	11	3	E3,4	C	111.510
2913.9526	22.8							
2913.8803	39.6	14	6	13	6	A1,2	C	216.718
2913.8728	20.3	14	6	13	6	E3,4	C	216.718
2913.8559	203.3	12	2	11	2	G	C	98.157
2913.8365	12.3							
2913.8096	49.1	12	2	11	2	E1	C	98.157
2913.7699	85.1	12	1	11	1	E1	C	90.144
2913.7626	201.4	12	1	11	1	G	C	90.144
2913.7222	129.6	12	0	11	0		C	87.473
2913.7145	13.2							
2913.7092	18.9							
2913.6888	34.8							
2913.6671	11.8							
2913.5564	14.4							
2913.5088	17.8							
2913.5026	27.3							
2913.2487	15.6							
2913.1668	10.4							
2912.8834	10.8	15	5	14	5		C	205.881
2912.8178	11.2							
2912.8003	42.2							
2912.7471	121.0	11	4	10	4	G	C	115.632
2912.7215	30.3	11	4	10	4	E1	C	115.632
2912.6644	17.0							
2912.6208	65.5	10	6	9	5	G	D	126.417
2912.5939	18.3	10	6	9	5	E1	D	126.417
2912.5833	41.2	13	6	12	6		C	199.504
2912.5608	11.2							
2912.5426	9.0							
2912.5283	12.3							
2912.4548	25.6							
2912.4358	28.5							
2912.3288	167.8	11	3	10	3		C	96.938
2912.2493	23.0							
2912.2006	207.1	11	2	10	2	G	C	83.584
2912.1606	50.6	11	2	10	2	E1	C	83.584
2912.1380	85.2	11	1	10	1	E1	C	75.572
2912.1287	215.4	11	1	10	1	G	C	75.572
2912.1188	14.6							
2912.0966	86.4	11	0	10	0		C	72.901
2912.0355	14.4							
2911.8304	10.8							
2911.7773	15.8							
2911.6728	15.0	14	5	13	5		C	187.346
2911.5537	8.5							
2911.5339	37.9							
2911.3801	16.5							
2911.2782	8.9							
2911.2663	62.7	12	6	11	6		C	183.610
2911.2245	11.1							
2911.2035	8.7							
2911.1905	24.4							
2911.0293	128.8	10	4	9	4	G	C	102.383
2911.0058	43.6	10	4	9	4	E1	C	102.383
2910.8971	66.9	9	6	8	5	G	D	114.490
2910.8623	16.8	9	6	8	5	E1	D	114.490
2910.8204	13.2							
2910.6522	180.8	10	3	9	3		C	83.688
2910.5608	224.8	10	2	9	2		C	70.334
2910.5259	96.8	10	1	9	1	E1	C	62.322
2910.5111	293.0	10	1	9	1	G	C	62.322
2910.4858	151.2	10	0	9	0		C	59.651
2910.4552	5.3	13	5	12	5		C	170.132
2910.2989	11.9							
2910.2740	32.3							
2910.2369	10.9							
2910.1006	17.8							
2909.9655	10.0							
2909.9549	22.5							
2909.9305	53.4	11	6	10	6		C	169.039
2909.9061	19.6							
2909.8899	9.2							
2909.7698	18.9							
2909.5947	9.4							
2909.5791	12.4							
2909.5507	14.1	16	5	15	4		D	201.703
2909.4834	9.5							
2909.4733	9.0							
2909.4360	36.3							
2909.4290	10.0							
2909.3753	25.9	12	5	11	5	G	C	154.238
2909.3233	6.1	12	5	11	5	E1	C	154.238
2909.3077	123.0	9	4	8	4	G	C	90.456
2909.2877	30.8	9	4	8	4	E1	C	90.456
2909.1733	49.8	8	6	7	5	G	D	103.888
2909.1418	9.2							
2909.1313	14.1	8	6	7	5	E1	D	103.888
2909.1094	9.5							
2909.0516	45.4	10	7	9	7		C	190.499
2909.0133	31.1							
2908.9899	199.2	9	3	8	3		C	71.762
2908.9392	210.2	9	2	8	2		C	58.408
2908.9268	32.8	9	0	8	0	E3	C	47.724
2908.9187	62.8	9	1	8	1	E1	C	50.395
2908.9118	230.3	9	1	8	1	G	C	50.395
2908.8937	91.8	9	0	8	0	A1	C	47.724
2908.8231	13.9							
2908.8126	9.9							
2908.7274	18.1							
2908.5834	29.1	10	6	9	6	E3,4	C	155.789
2908.5761	49.4	10	6	9	6	A1,2	C	155.789
2908.5446	16.1							
2908.5384	11.2	15	5	14	4		D	181.848
2908.4235	8.5							
2908.2621	31.3	11	5	10	5	G	C	139.666
2908.2117	6.9	11	5	10	5	E1	C	139.666
2908.1734	27.0							
2907.8756	16.8							
2907.8644	22.3							
2907.8151	8.9							
2907.7818	9.0							
2907.7497	11.8							
2907.7027	11.6							
2907.5842	117.7	8	4	7	4	G	C	79.853
2907 5656	28.3	8	4	7	4	E1	C	79.853
2907 5230	15.0	14	5	13	4		D	163.313
2907 5100	15.5							
2907.4507	32.9	7	6	6	5		D	94.610
2907.4322	35.3	9	7	8	7		C	178.573
2907.3973	10.0							
2907.3468	246.9	8	2	7	2		C	47.805
2907.3370	358.6	8	1	7	1		C	39.792
2907.3210	150.7	8	0	7	0		C	37.121
2907.3081	52.1							
2907.2165	24.8	9	6	8	6	E3,4	C	143.863
2907.2053	48.8	9	6	8	6	A1,2	C	143.863
2907.1621	35.2	10	5	9	5	G	C	126.417
2907.1165	8.2	10	5	9	5	E1	C	126.417
2907.0208	8.5							
2906.9145	28.2							
2906.9083	12.9							
2906.5975	21.1							
2906.5074	9.0	13	5	12	4		D	146.098
2906.3255	12.2							
2906.3105	9.0							
2906.3023	16.5							
2906.2761	11.8							
2906.1229	10.6							
2906.1072	37.3							
2906.0760	37.9	9	5	8	5	G	C	114.490
2906.0328	10.0	9	5	8	5	E1	C	114.490
2905.9037	18.9							
2905.8632	108.6	7	4	6	4	G	C	70.575
2905.8454	29.1	7	4	6	4	E1	C	70.575
2905.8366	21.5	8	6	7	6	E3,4	C	133.261
2905.8214	40.0	8	6	7	6	A1,2	C	133.261
2905.7989	32.5	7	0	6	0	E3	C	27.842
2905.7920	28.1	8	7	7	7		C	167.971
2905.7690	125.8	7	0	6	0	A1	C	27.842
2905.7579	334.4	7	1	6	1		C	30.513
2905.7313	52.9	7	2	6	2		C	38.526
2905.7239	186.3	7	3	6	3		C	51.880
2905.6637	24.9							
2905.5863	8.4							
2905.4898	12.1	12	5	11	4		D	130.204
2905.3700	19.4							
2905.1029	14.4							
2905.0004	45.4	8	5	7	5	G	C	103.888
2904.9673	11.2	8	5	7	5	E1	C	103.888
2904.9266	37.2							
2904.4701	14.2	11	5	10	4		D	115.632
2904.4476	18.1	7	6	6	6	E3,4	C	123.983
2904.4288	28.1	7	6	6	6	A1,2	C	123.983
2904.4200	22.3							
2904.3994	12.2							
2904.2712	87.3	6	0	5	0	E4	C	19.888
2904.2431	156.6	6	0	5	0	A2	C	19.888
2904.2349	219.6	6	1	5	1		C	22.559
2904.2062	183.4	6	2	5	2	G	C	30.572
2904.1793	46.4	6	2	5	2	E1	C	30.572
2904.1543	15.5							
2904.1455	89.6	6	4	5	4		C	62.621
2904.1267	178.2	6	3	5	3		C	43.926
2903.9410	34.4	7	5	6	5	G	C	94.610
2903.9135	18.8	7	5	6	5?	E1	C	94.610
2903.7496	18.6							
2903.4491	11.3	10	5	9	4		D	102.383
2903.1836	13.9							
2902.9501	11.7							
2902.9032	23.5	6	5	5	5	G	C	86.656
2902.8871	6.5	6	5	5	5	E1	C	86.656
2902.7679	30.5	5	0	4	0	E3	C	13.259
2902.7408	83.9	5	0	4	0	A1	C	13.259
2902.7284	199.3	5	1	4	1		C	15.930
2902.6808	161.6	5	2	4	2	G	C	23.943
2902.6546	45.2	5	2	4	2	E1	C	23.943
2902.5672	15.5							
2902.5566	128.5	5	3	4	3		C	37.297
2902.4377	55.9	5	4	4	4	G	C	55.992
2902.4177	16.4	5	4	4	4	E1	C	55.992
2901.9527	12.3							
2901.5747	10.9							
2901.4856	11.4							
2901.4081	11.3	8	5	7	4		D	79.853
2901.3853	9.7							
2901.3270	17.6							
2901.2922	71.5	4	0	3	0	E4	C	7.956
2901.2665	112.9	4	0	3	0	A2	C	7.956
2901.2498	166.0	4	1	3	1		C	10.627
2901.1840	120.6	4	2	3	2	G	C	18.640
2901.1580	32.4	4	2	3	2	E1	C	18.640
2901.1089	8.5							
2901.0226	70.5	4	3	3	3		C	31.994
2900.7293	8.9							
2900.5847	10.7							
2900.3864	6.5	7	5	6	4		D	70.575
2900.3660	8.7							
2900.2734	8.9							
2900.1514	7.6	12	6	12	5		D	170.132
2900.1133	8.9							
2899.8440	18.6	3	0	2	0	E3	C	3.978
2899.8194	52.2	3	0	2	0	A1	C	3.978
2899.7984	121.4	3	1	2	1		C	6.649
2899.7650	14.2	11	6	11	5	G	D	154.238
2899.7462	5.7	11	6	11	5	E1	D	154.238
2899.7193	71.6	3	2	2	2	G	C	14.662
2899.6949	18.4	3	2	2	2	E1	C	14.662
2899.5119	10.4							
2899.3667	14.9	10	6	10	5	G	D	139.666
2899.3389	3.7	10	6	10	5	E1	D	139.666
2899.1141	8.4							
2898.9671	18.1	9	6	9	5	G	D	126.417
2898.9319	5.7	9	6	9	5	E1	D	126.417
2898.9170	11.7							
2898.9089	12.1							
2898.5687	21.1	8	6	8	5	G	D	114.490
2898.5512	12.6	12	4	12	4		C	146.098
2898.5256	7.9	8	6	8	5	E1	D	114.490
2898.4761	12.2							
2898.4267	35.2	2	0	1	0	E4	C	1.326
2898.4011	59.7	2	0	1	0	A2	C	1.326
2898.3773	73.7	2	1	1	1		C	3.997
2898.1691	23.5	7	6	7	5	G	D	103.888
2898.1265	8.7							
2898.1177	5.0	7	6	7	5	E1	D	103.888
2898.1120	10.0							
2897.9508	8.4							
2897.7738	27.2	10	4	10	4		C	115.632
2897.7626	23.3	6	6	6	5		D	94.610
2897.7488	20.7	11	3	11	3		C	111.510
2897.7127	13.1							
2897.6793	9.9							
2897.6063	11.7							
2897.3958	23.6	10	3	10	3		C	96.938
2897.3767	34.8	9	4	9	4	G	C	102.383
2897.3574	10.4	9	4	9	4	E1	C	102.383
2897.3051	11.9	10	2	10	2		C	83.584
2897.1994	20.6							
2897.1815	8.7							
2897.0978	9.7							
2897.0595	34.5	9	3	9	3		C	83.688
2897.0380	9.5	1	0	0	0	E3	C	
2897.0141	20.2	1	0	0	0	A1	C	
2897.0080	17.8	9	2	9	2		C	70.334
2896.9783	50.4	8	4	8	4	G	C	90.456
2896.9604	18.4	8	4	8	4	E1	C	90.456
2896.7974	10.7							
2896.7409	45.4	8	3	8	3		C	71.762
2896.7318	22.1							
2896.6526	28.0							
2896.6370	9.2							
2896.6282	13.4							
2896.5824	69.5	7	4	7	4	G	C	79.853
2896.5651	19.4	7	4	7	4	E1	C	79.853
2896.5262	11.3							
2896.4788	29.2	13	7	13	7		C	251.426
2896.4431	62.1	7	3	7	3		C	61.159
2896.4175	9.4							
2896.2959	23.1	12	7	12	7		C	234.212
2896.2792	9.7	6	1	6	1		C	30.513
2896.2511	33.7	6	2	6	2	G	C	38.526
2896.2242	8.1	6	2	6	2	E1	C	38.526
2896.1911	90.4	6	4	6	4		C	70.575
2896.1723	91.8	6	3	6	3		C	51.880
2896.0992	14.2	5	1	5	1		C	22.559
2896.0660	32.8	11	7	11	7		C	218.319
2896.0504	48.6	5	2	5	2	G	C	30.572
2896.0248	14.7	5	2	5	2	E1	C	30.572
2895.9449	50.6							
2895.9290	103.9	5	3	5	3		C	43.926
2895.8944	9.7							
2895.8802	67.4	4	2	4	2	G	C	23.943
2895.8549	19.1	4	2	4	2	E1	C	23.943
2895.8203	25.9	3	1	3	1		C	10.627
2895.8078	130.9	5	4	5	4	G	C	62.621
2895.7978	48.6	10	7	10	7		C	203.748
2895.7884	34.3	5	4	5	4	E1	C	62.621
2895.7410	86.8	3	2	3	2		C	18.640
2895.7257	38.0	2	1	2	1		C	6.849
2895.7184	148.9	4	3	4	3		C	37.297
2895.6621	66.2	1	1	1	1		C	3.997
2895.6358	131.5	2	2	2	2	G	C	14.662
2895.6114	32.0	2	2	2	2	E1	C	14.662
2895.5439	182.7	3	3	3	3		C	31.994
2895.5037	71.0	9	7	9	7		C	190.499
2895.4401	194.6	4	4	4	4	G	C	55.992
2895.4164	50.6	4	4	4	4	E1	C	55.992
2895.3639	42.0	12	6	12	6		C	199.504
2895.3515	51.1							
2895.3287	38.5	10	6	10	6	E3,4	C	169.039
2895.3212	58.0	10	6	10	6	A1,2	C	169.039
2895.2871	38.1	9	6	9	6		C	155.789
2895.2749	253.1	5	5	5	5		C	86.656
2895.2318	49.1	8	6	8	6	E3,4	C	143.863
2895.2162	87.0	8	6	8	6	A1,2	C	143.863
2895.1878	104.9	8	7	8	7		C	178.573
2895.1675	58.3	7	6	7	6	E3,4	C	133.261
2895.1483	112.7	7	6	7	6	A1,2	C	133.261
2895.0987	73.4	6	6	6	6	E3,4	C	123.983
2895.0762	149.2	6	6	6	6	A1,2	C	123.983
2894.9480	116.6	6	5	6	5	G	C	94.610
2894.9317	31.0	6	5	6	5	E1	C	94.610
2894.8557	128.1	7	7	7	7		C	167.971
2894.6614	83.7	7	5	7	5	G	C	103.888
2894.6336	23.0	7	5	7	5	E1	C	103.888
2894.5990	84.7	8	8	8	8	G	C	218.619
2894.5790	24.1	8	8	8	8	E1	C	218.619
2894.3952	59.3	8	5	8	5	G	C	114.490
2894.3621	14.7	8	5	8	5	E1	C	114.490
2894.3559	19.4							
2894.3319	28.2							
2894.2739	79.5							
2894.1460	46.4	9	5	9	5	G	C	126.417
2894.1025	13.4	9	5	9	5	E1	C	126.417
2893.9868	9.7							
2893.9174	31.3							
2893.9080	35.3	10	5	10	5	G	C	139.666
2893.8610	6.2	10	5	10	5	E1	C	139.666
2893.7017	38.4							
2893.6829	25.8	11	5	11	5	G	C	154.238
2893.6596	16.5							
2893.6318	8.7	11	5	11	5	E1	C	154.238
2893.5481	8.9							
2893.4790	11.8							
2893.4709	22.6	12	5	12	5	G	C	170.132
2893.4614	24.4							
2893.4272	23.3							
2893.4184	8.9	12	5	12	5	E1	C	170.132
2893.2808	13.4							
2893.1744	37.6							
2893.1207	7.9	14	5	14	5		C	205.881
2893.0607	14.4	1	0	2	0	E3	C	3.978
2893.0369	35.3	1	0	2	0	A1	C	3.978
2893.0100	72.7	1	1	2	1		C	6.649
2892.9738	8.5							
2892.9075	12.7							
2892.8862	15.0							
2892.7693	9.5							
2892.6853	20.6							
2892.3678	9.7							
2892.3398	33.7							
2892.3245	11.2							
2892.2590	9.5							
2892.2509	13.7							
2891.7962	46.7	2	0	3	0	E4	C	7.956
2891.7718	74.9	2	0	3	0	A2	C	7.956
2891.7474	108.6	2	1	3	1		C	10.627
2891.7156	14.4	5	5	5	4		D	62.621
2891.6578	63.3	2	2	3	2	G	C	18.640
2891.6338	15.9	2	2	3	2	E1	C	18.640
2891.5360	25.5							
2891.4115	21.5	6	5	6	4		D	70.575
2891.1071	20.7	7	5	7	4		D	79.853
2890.9651	9.0							
2890.9138	16.6							
2890.8744	12.1							
2890.8023	20.7	8	5	8	4		D	90.456
2890.5625	17.6	3	0	4	0	E3	C	13.259
2890.5371	57.8	3	0	4	0	A1	C	13.259
2890.5167	140.9	3	1	4	1		C	15.930
2890.4988	16.3	9	5	9	4		D	102.383
2890.4379	105.0	3	2	4	2	G	C	23.943
2890.4129	27.8	3	2	4	2	E1	C	23.943
2890.3000	8.7							
2890.2653	10.6							
2890.2416	61.1	3	3	4	3		C	37.297
2890.2009	16.6							
2890.1940	17.6	10	5	10	4		D	115.632
2889.8896	10.6	11	5	11	4		D	130.204
2889.6811	11.4							
2889.5850	10.9	12	5	12	4		D	146.098
2889.3581	68.2	4	0	5	0	E4	C	19.888
2889.3321	112.5	4	0	5	0	A2	C	19.888
2889.3155	168.2	4	1	5	1		C	22.559
2889.2783	8.9	13	5	13	4		D	163.313
2889.2512	133.7	4	2	5	2	G	C	30.572
2889.2259	35.5	4	2	5	2	E1	C	30.572
2889.1895	8.7							
2889.0896	95.2	4	3	5	3		C	43.926
2888.9715	9.0	14	5	14	4		D	181.848
2888.8101	41.7	4	4	5	4	G	C	62.621
2888.7864	10.9	4	4	5	4	E1	C	62.621
2888.4824	11.8	6	6	7	5	G	D	103.888
2888.4573	3.7	6	6	7	5	E1	D	103.888
2888.1827	24.6	5	0	6	0	E3	C	27.842
2888.1566	66.4	5	0	6	0	A1	C	27.842
2888.1435	170.5	5	1	6	1		C	30.513
2888.0960	142.1	5	2	6	2	G	C	38.526
2888.0697	36.5	5	2	6	2	E1	C	38.526
2887.9733	119.9	5	3	6	3		C	51.880
2887.8527	65.7	5	4	6	4	G	C	70.575
2887.8333	20.2	5	4	6	4	E1	C	70.575
2887.5651	13.1	7	6	8	5	G	D	114.490
2887.5125	4.5	7	6	8	5	E1	D	114.490
2887.3199	37.0	5	5	6	5		C	94.610
2887.0585	11.1							
2887.0348	72.4	6	0	7	0	E4	C	37.121
2887.0060	128.8	6	0	7	0	A2	C	37.121
2886.9979	178.0	6	1	7	1		C	39.792
2886.9697	151.4	6	2	7	2	G	C	47.805
2886.9431	37.2	6	2	7	2	E1	C	47.805
2886.9110	76.1	6	4	7	4		C	79.853
2886.8919	145.1	6	3	7	3		C	61.159
2886.6377	24.1	8	6	9	5	G	D	126.417
2886.6170	14.2							
2886.5945	8.2	8	6	9	5	E1	D	126.417
2886.4632	9.9							
2886.1737	10.8							
2886.0853	11.2							
2886.0161	16.9							
2885.9766	83.6	7	4	8	4	G	C	90.456
2885.9598	22.6	7	4	8	4	E1	C	90.456
2885.9123	26.5	7	0	8	0	E3	C	47.724
2885.8823	102.5	7	0	8	0	A1	C	47.724
2885.8711	250.3	7	1	8	1		C	50.395
2885.8439	41.7	7	2	8	2		C	58.408
2885.8376	146.4	7	3	8	3		C	71.762
2885.8186	12.3	6	6	7	6	E3,4	C	133.261
2885.7960	25.1	6	6	7	6	A1,2	C	133.261
2885.7116	27.0	9	6	10	5	G	D	139.666
2885.6772	7.6	9	6	10	5	E1	D	139.666
2885.6678	44.2	6	5	7	5	G	C	103.888
2885.6520	12.6	6	5	7	5	E1	C	103.888
2885.6355	9.7							
2885.3902	8.4							
2885.2467	9.0							
2885.0475	82.6	8	4	9	4	G	C	102.383
2885.0293	20.1	8	4	9	4	E1	C	102.383
2884.8099	186.8	8	2	9	2		C	70.334
2884.7988	254.2	8	1	9	1		C	62.322
2884.7827	118.9	8	0	9	0		C	59.651
2884.7704	39.4							
2884.5903	9.0							
2884.5629	19.6	7	6	8	6	E3,4	C	143.863
2884.5440	34.7	7	6	8	6	A1,2	C	143.863
2884.4828	12.7							
2884.2510	16.0	7	7	8	7		C	178.573
2884.1213	78.6	9	4	10	4	G	C	115.632
2884.1015	21.8	9	4	10	4	E1	C	115.632
2884.0563	52.6	7	5	8	5	G	C	114.490
2884.0294	12.3	7	5	8	5	E1	C	114.490
2883.8606	27.5	11	6	12	5	G	D	170.132
2883.8421	8.0	11	6	12	5	E1	D	170.132
2883.8037	129.0	9	3	10	3		C	96.938
2883.7519	144.6	9	2	10	2		C	83.584
2883.7389	23.3							
2883.7309	41.0	9	1	10	1	E1	C	75.572
2883.7241	162.8	9	1	10	1	G	C	75.572
2883.7056	84.0	9	0	10	0		C	72.901
2883.3023	21.2	8	6	9	6	E3,4	C	155.789
2883.2868	40.1	8	6	9	6	A1,2	C	155.789
2883.2591	28.0	8	7	9	7		C	190.499
2883.1933	72.7	10	4	11	4	G	C	130.204
2883.1708	20.2	10	4	11	4	E1	C	130.204
2882.9866	9.2							
2882.9231	29.2	12	6	13	5		D	187.346
2882.8156	114.9	10	3	11	3		C	111.510
2882.7236	134.5	10	2	11	2		C	98.157
2882.6893	61.8	10	1	11	1	E1	C	90.144
2882.6730	187.4	10	1	11	1	G	C	90.144
2882.6484	93.7	10	0	11	0		C	87.473
2882.4654	47.6	8	5	9	5	G	C	126.417
2882.4318	13.9	8	5	9	5	E1	C	126.417
2882.2628	67.2	11	4	12	4	G	C	146.098
2882.2495	30.1	9	7	10	7		C	203.748
2882.2368	19.6	11	4	12	4	E1	C	146.098
2882.1306	12.9	6	5	7	4		D	79.853
2882.0326	21.2	9	6	10	6	E3,4	C	169.039
2882.0214	42.2	9	6	10	6	A1,2	C	169.039
2881.9702	11.3							
2881.9540	8.7							
2881.9181	14.6							
2881.8761	9.7							
2881.8435	101.0	11	3	12	3		C	127.404
2881.7143	117.3	11	2	12	2	G	C	114.051
2881.6743	30.5	11	2	12	2	E1	C	114.051
2881.6518	49.6	11	1	12	1	E1	C	106.038
2881.6424	129.0	11	1	12	1	G	C	106.038
2881.6093	49.6	11	0	12	0		C	103.367
2881.5799	9.0							
2881.4642	11.2							
2881.3228	57.8	12	4	13	4	G	C	163.313
2881.2941	17.3	12	4	13	4	E1	C	163.313
2881.2747	15.4							
2881.2284	9.9							
2881.2197	31.8	10	7	11	7		C	218.319
2881.1834	9.2							
2881.0621	9.0							
2880.8917	43.3	9	5	10	5	G	C	139.666
2880.8830	83.9	12	3	13	3	A1,2	C	144.619
2880.8776	42.4	12	3	13	3	E3,4	C	144.619
2880.8476	13.4	9	5	10	5	E1	C	139.666
2880.7920	13.1							
2880.7496	24.0	10	6	11	6	E3,4	C	183.610
2880.7422	44.6	10	6	11	6	A1,2	C	183.610
2880.7206	104.7	12	2	13	2	G	C	131.266
2880.6755	29.0	12	2	13	2	E1	C	131.266
2880.6350	50.6	12	1	13	1	E1	C	123.254
2880.6287	116.7	12	1	13	1	G	C	123.254
2880.6187	9.0							
2880.5956	8.7							
2880.5862	78.6	12	0	13	0		C	120.583
2880.5019	16.1	7	5	8	4		D	90.456
2880.4741	13.9							
2880.3692	48.3	13	4	14	4	G	C	181.848
2880.3537	7.9	13	4	14	4	E1	C	181.848
2880.1641	26.5	11	7	12	7		C	234.212
2880.0372	11.6							
2879.9251	36.7	13	3	14	3	E3,4	C	163.155
2879.9190	63.1	13	3	14	3	A1,2	C	163.155
2879.7417	87.8	13	2	14	2	G	C	149.801
2879.6895	22.3	13	2	14	2	E1	C	149.801
2879.6398	26.0	13	1	14	1	E1	C	141.789
2879.6278	99.9	13	1	14	1	G	C	141.789
2879.5770	47.1	13	0	14	0		C	139.118
2879.5391	15.9							
2879.4486	41.9	11	6	12	6		C	199.504
2879.4163	36.5	14	4	15	4	G	C	201.703
2879.3711	10.9	14	4	15	4	E1	C	201.703
2879.3281	38.6	10	5	11	5	G	C	154.238
2879.2818	12.9	10	5	11	5	E1	C	154.238
2879.0873	9.0							
2879.0692	23.3	12	7	13	7		C	251.426
2878.9929	63.8	14	3	15	3	A1,2	C	183.009
2878.9779	32.4	14	3	15	3	E3,4	C	183.009
2878.9443	10.4							
2878.8716	20.2	8	5	9	4		D	102.383
2878.7726	71.1	14	2	15	2	G	C	169.656
2878.7109	16.3	14	2	15	2	E1	C	169.656
2878.6527	19.8	14	1	15	1	E1	C	161.644
2878.6396	81.3	14	1	15	1	G	C	161.644
2878.6233	9.5							
2878.5789	53.4	14	0	15	0		C	158.973
2878.4526	30.6	15	4	16	4	G	C	222.875
2878.3913	9.7	15	4	16	4	E1	C	222.875
2878.1365	48.8	12	6	13	6		C	216.718
2878.0780	12.6							
2878.0525	52.6	15	3	16	3	A1,2	C	204.182
2878.0344	26.1	15	3	16	3	E3,4	C	204.182
2877.8913	9.2							
2877.8129	60.8	15	2	16	2	G	C	190.829
2877.7783	33.9	11	5	12	5		C	170.132
2877.7369	15.4	15	2	16	2	E1	C	190.829
2877.7282	8.9							
2877.6875	19.6	15	1	16	1	E1	C	182.817
2877.6609	65.0	15	1	16	1	G	C	182.817
2877.5890	27.0	15	0	16	0		C	180.147
2877.4843	9.0							
2877.4495	27.5	16	4	17	4		C	245.365
2877.3739	8.7							
2877.2741	11.2							
2877.2432	21.5	9	5	10	4		D	115.632
2877.1143	42.5	16	3	17	3	A1,2	C	226.672
2877.0905	23.6	16	3	17	3	E3,4	C	226.672
2877.0035	8.9							
2876.9586	11.4							
2876.9248	16.4							
2876.8604	49.4	16	2	17	2	G	C	213.320
2876.8053	31.3	13	6	14	6		C	235.252
2876.7705	11.8	16	2	17	2	E1	C	213.320
2876.7416	10.8							
2876.6985	20.2	16	1	17	1	E1	C	205.308
2876.6872	57.5	16	1	17	1	G	C	205.308
2876.5989	34.9	16	0	17	0		C	202.637
2876.4330	22.1	17	4	18	4		C	269.172
2876.2436	27.3	12	5	13	5	G	C	187.346
2876.1907	8.5	12	5	13	5	E1	C	187.346
2876.1738	32.4	17	3	18	3	A1,2	C	250.479
2876.1407	19.6	17	3	18	3	E3,4	C	250.479
2875.9099	43.8	17	2	18	2	G	C	237.127
2875.7880	15.8	17	2	18	2	E1	C	237.127

TABLE 2. *continued*

WAVENUMBER	INT	TRANSITION				SYM	BAND	E LOWER
2875.7628	23.5							
2875.7370	9.2							
2875.7166	44.4	17	3	18	1	C		229.115
2875.6660	10.2							
2875.6147	36.5	17	0	18	0	C		226.444
2875.4546	21.8	14	6	15	6	A1,2	C	255.106
2875.3678	12.1	14	6	15	6	E3,4	C	255.106
2875.3890	19.3	18	4	19	4	C		294.253
2875.2260	25.6	18	3	19	3	A1,2	C	275.601
2875.1807	14.9	18	3	19	3	E3,4	C	275.601
2874.9581	28.6	18	2	19	2	C		292.248
2874.8036	11.9							
2874.7816	10.2							
2874.7802	15.9							
2874.7422	34.0	18	1	19	1	C		254.237
2874.7288	21.8	13	5	14	5	G	C	205.881
2874.6761	8.0	13	5	14	5	E1	C	205.881
2874.6129	24.3	18	0	19	0	C		251.566
2874.5785	12.9							
2874.1453	17.3	19	3	20	3	A1,2	C	302.036
2874.1990	11.3	19	3	20	3	E3,4	C	302.036
2874.0852	18.8	15	6	16	6	A1,2	C	276.278
2874.0739	12.4	15	6	16	6	E3,4	C	276.278
2874.0564	11.4							
2873.9836	28.1	11	5	12	4	D		146.098
2873.9329	9.7							
2873.7561	26.1	19	1	20	1	C		280.673
2873.5795	9.9	19	0	20	0	C		278.002
2873.3648	10.9							
2873.3184	14.7							
2873.2785	8.9							
2873.2480	14.1	14	5	15	5	C		225.735
2873.0337	15.8	20	2	21	2	C		316.433
2872.9752	10.2							
2872.8855	8.4							
2872.8706	9.5							
2872.8576	8.7							
2872.7401	20.8	20	1	21	1	C		308.421
2872.6940	13.9	16	6	17	6	A1,2	C	298.768
2872.6816	9.7	16	6	17	6	E3,4	C	298.768
2872.4767	11.4							
2872.3786	13.7							
2872.1561	20.9	12	5	13	4	D		163.313
2872.1067	11.4							
2872.1935	8.5							
2871.8108	10.9	15	5	16	5	C		246.908
2871.6564	16.4	21	1	22	1	C		337.481
2871.2842	12.4	19	6	18	6	A1,2	C	322.573
2871.2690	7.7	17	6	18	6	E3,4	C	322.573
2871.2123	12.4							

WAVENUMBER	INT	TRANSITION				SYM	BAND	E LOWER
2871.2123	12.4							
2870.8096	13.8							
2870.7258	19.8	13	5	14	4	D		181.848
2870.4183	9.0							
2869.8572	6.1	18	6	19	6	A1,2	C	347.694
2869.8407	2.2	18	6	19	6	E3,4	C	347.694
2869.5820	9.2							
2869.2293	11.4							
2869.0962	15.2	14	5	15	4	D		201.703
2867.7530	9.7							
2867.6389	11.6							
2867.4661	14.9	15	5	16	4	D		222.875
2866.5375	9.7							
2866.0395	10.9							
2865.8316	7.5	16	5	17	4	D		245.365
2864.7775	9.7							
2864.5353	14.4							
2864.4327	8.7							
2864.3029	8.7							
2864.1960	12.2							
2864.1133	9.7							
2863.6629	9.9							
2863.0441	8.5							
2863.0153	8.7							
2862.8202	9.9							

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